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Vol. 1057 Number 3

OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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August 20, 1985 Volume 1057 Number 3

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
August 20, 1995 Volume 1057 Number 3

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
May 7, 1985. *Acting Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on August 17, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,344,189 through 4,345,334

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,277,321, Re. S.N. 437,471, Filed Oct. 28, 1982, Cl. 204/192, TREATING MULTILAYER PRINTED WIRING BOARDS, Charles J. Bartlett, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 112

4,393,497, Re. S.N. 750,894, Filed July 1, 1985, Cl. 370/089, LOOP SWITCHING SYSTEM, Richard F. Cantwell, Jr., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: Roy C. Litton, Ex. Gp.: 264

4,398,614, Re. S.N. 748,488, Filed June 25, 1985, Cl. 177/2S, COMBINATORIAL WEIGHING SYSTEM WITH DISCHARGE CONTROL, Yukio Kakita, et al., Owner of Record: *Ishida Scales Mfg. Co., Ltd., Kyoto, Japan,* Attorney or Agent: Paul D. Flehr, et al., Ex. Gp.: 216

4,420,694, Re. S.N. 749,676, Filed June 28, 1985, Cl. 307/130, MUTING CIRCUIT, Teppei Yokota, et al., Owner of Record: *Sony Corp., Tokyo, Japan,* Attorney or Agent: James van Santen, et al., Ex. Gp.: 214

4,435,467, Re. S.N. 638,240, Filed Aug. 6, 1984, Cl. 428/254, ATHLETIC SUPPORT FABRIC, Jack S. Rogers, Owner of Record: *Milliken Research Corp., Spartanburg, S.C.,* Attorney or Agent: H. William Petry, et al., Ex. Gp.: 154

4,470,,508, Re. S.N. 745,538, Filed June 17, 1985, Cl. 206/334, DUSTFREE PACKAGING CONTAINER AND METHOD, Yung-Tsai Yen, Owner of Record: *By Mesne Assight, Yung-Tsai Yen, Los Altos, Calif.,* Attorney or Agent: J. Pierre Kolisch, et al., Ex. Gp.: 241

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Des. 278,415, Reexam. No. 90/000,816, Requested: July 5, 1985, Cl. 10/40, WALL TIMER, Kenneth R. Fenne, Owner of Record: *Pittway Corp., Aurora, Ill.,* Attorney or Agent: Emrich & Dithmar, Ex. Gp.: 290, Requester: Owner

3,951,033, Reexam. No. 90/000,818, Requested: July 8, 1985, Cl. 411/468, CONNECTOR PLATE, Walter G. Moehlenpah, Owner of Record: *Moehlenpah Industries, Inc., Creve Coeur, Md.,* Attorney or Agent: Senniger, Powers, et al., Ex. Gp.: 350, Requester: Owner

4,132,164, Reexam. No. 90/000,820, Requested: July 12, 1985, Cl. 100/89, BALER LOADING METHOD AND APPARATUS, Allan A. White, Owner of Record: *Hesston Corp., Hesston, Kans.,* Attorney or Agent: Schmidt, Johnson, et al., Ex. Gp.: 240, Requester: Sperry New Holland, New Holland, Pa.

4,296,570, Reexam. No. 90/000,822, Requested: July 15, 1985, Cl. 49/360, HYDRAULIC DOOR OPERATOR, George C. Balbach, et al., Owner of Record: *Arthur Smith Industries, Inc., Milwaukee, Wis.,* Attorney or Agent: Thomas W. Ehrmann, Ex. Gp.: 350, Requester: Owner

4,353,991, Reexam. No. 90/000,812, Requested: July 2, 1985, Cl. 501/20, GLASS COMPOSITION AND METHOD OF MANUFACTURE AND ARTICLE PRODUCED THEREFROM, John F. van Ness, et al., Owner of Record: *Ferro Corp., Cleveland, Ohio,* Attorney or Agent: Baldwin, Egan, et al., Ex. Gp.: 110, Requester: E. Merck, Darmstat, Fed. Rep. of Germany

4,479,466, Reexam. No. 90/000,814, Requested: July 5, 1985, Cl. 123/527, NATURAL GAS AND AIR MIXING DEVICE, Donald O. Greenway, et al., Owner of Record: *Inventors,* Attorney or Agent: Jones & Askew, Ex. Gp.: 340, Requester: Dual Fuels Assocs. Corp., Orem, Utah

4,495,285, Reexam. No. 90/000,821, Requested: July 12, 1985, Cl. 435/215, PLASMINOGEN ACTIVATOR DERIVATIVES, Kimihiro Shimizu, et al., Owner of Record: *Nippon Chemiphar Co., Ltd., Tokyo, Japan,* Attorney or Agent: Oblon, Fisher, et al., Ex. Gp.: 120, Requester: Enzon, Inc., South Plainfield, N.J.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to the registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assignes or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Envirofood, Inc., assignee by mesne assignment of Richard B. Sawtelle, dba Farmers Market Preserving Kitchen, Santa Barbara, Calif., Reg. No. 828,850, for the mark "FARMERS MARKET", Canc. No. 14,392.

ERMA S. BROWN,
Administrator
Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Availability of Concordance — Fifth Edition

The Patent and Trademark Office announces the availability of the "Concordance Fifth Edition-1985 United States Patent Classification to International Patent Classification" which relates the U.S. Patent Classification, as revised through Feb. 29, 1984, (Classification Order No. 929) to the Fourth Edition of the International Patent Classification, 1984, as published for the World Intellectual Property Organizations by Carl Heymanns Verlag K. G., Munich.

Copies of the Concordance are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Stock Number 003-004-00611-1. The price for this publication is $6.50 for U.S. and $8.15 for foreign mailing.

WILLIAM S. LAWSON,
July 3, 1985. *Administrator for Documentation.*

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-734,647. BOLL WEEVIL TRAP.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-623,923. PROCESS FOR SITE-SPECIFIC MUTAGENESIS WITHOUT PHENOTYPIC SELECTION.

SN 6-675,276. SYNTHESIS AND UTILIZATION OF 17-METHYL AND 17-CYCLOPROPYLMETHYL-3, 14-DIHYDROXY-4, 5-EPOXY 6-FLUOROMORPHINANS (FOXY AND CYCLOFOXY) AS [^{18}F]— LABELED OPIOID LIGANDS FOR POSITRON EMISSION TRANSAXIAL TOMOGRAPHY (PETT).

SN 6-741,600. ISOLATED, SOLUBLE IMMUNOGEN AGAINST SCHISTOSOMA MANSONI AND A METHOD OF VACCINATION EMPLOYING SAME.

SN 6-743,570. HUMAN MONOCYTES CULTURED IN SUSPENSION IN SERUM FREE MEDIUM.

DEPARTMENT OF THE AIR FORCE

SN 6-541,594. TEST TARGET FOR ADATIVE OPTICS.

SN 6-541,820. CCD GAUSSIAN CONVOLUTION METHOD.

SN 6-640,623. OVER-CENTER TOGGLE LATCH.

SN 6-693,927. VISION TEST CHART AND METHOD USING GAUSSIANS.

SN 6-726,872. TOTAL INTERNAL REFLECTION MODULATOR/DEFLECTOR.

SN 6-727,507. TUNABLE ACOUSTO-OPTIC FILTER WITH IMPROVED SPECTRAL RESOLUTION AND INCREASED APERTURE.

SN 6-729,388. IMPROVED TEMPERATURE DETECTION SYSTEM FOR USE ON FILM COOLED TURBINE AIRFOILS.

SN 6-738,817. PHOTOIONIZATION TECHNIQUE FOR GROWTH OF METALLIC FILMS.

SN 6-739,413. INSTANTANEOUS FREQUENCY MEASUREMENT RECEIVER WITH DIGITAL PROCESSING.

SN 6-742,825. SIGNAL ANALYSIS RECEIVER WITH ACOUSTO-OPTIC DELAY LINES.

DEPARTMENT OF THE ARMY

SN 6-742,152. DUAL OPTICAL MECHANICAL POSITION TRACKER.

SN 6-744,344. RECHARGEABLE LITHIUM-ORGANIC ELECTROLYTE BATTERY HAVING OVERCHARGE PROTECTION AND METHOD OF PROVIDING OVERCHARGE PROTECTION FOR A LITHIUM-ORGANIC ELECTROLYTE BATTERY.

In the Official Gazette, Vol. 1056, No. 1, July 2, 1985, the Table of Official Gazette Volume Numbers contained two errors. The corrected table below should be substituted for the earlier version.

TABLE OF OFFICIAL GAZETTE VOLUME NUMBERS: 1872–1990

A table which relates volume numbers of the Official Gazette comprising collections of weekly issues of that publication to the month of their publication has found good use in the Patent and Trademark Office and Patent Depository Libraries in a variety of applications. The need for such a table arises, in part, from the fact that Official Gazette volumes have not been uniformly numbered on a monthly basis over the 110 year history of that publication. From Jan. 1872 through June 1883, they were numbered on a semi-annual basis; from July 1883 through Dec. 1902, quarterly; from Jan. 1902 through Dec. 1908, bi-monthly; and, since Jan. 1909, the volume of issues for each month has been separately numbered. To fulfill the interest which has been expressed in this table, it is published below:

Calendar Table of Official Gazette Volume Numbers

Month-by-Month Volume Numbers: Jan. 1872 to Present

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1872*	1	1	1	1	1	1	2	2	2	2	2	2
1873	3	3	3	3	3	3	4	4	4	4	4	4
1874	5	5	5	5	5	5	6	6	6	6	6	6
1875	7	7	7	7	7	7	7	8	8	8	8	8
1876	9	9	9	9	9	9	10	10	10	10	10	10
1877	11	11	11	11	11	11	12	12	12	12	12	12
1878	13	13	13	13	13	13	14	14	14	14	14	14
1879	15	15	15	15	15	15	16	16	16	16	16	16
1880	17	17	17	17	17	17	18	18	18	18	18	18
1881	19	19	19	19	19	19	20	20	20	20	20	20
1882	21	21	21	21	21	21	22	22	22	22	22	22
1883*	23	23	23	23	23	23	24	24	24	25	25	25
1884	26	26	26	27	27	27	28	28	28	29	29	29
1885	30	30	30	31	31	31	32	32	32	33	33	33
1886	34	34	34	35	35	35	36	36	36	37	37	37
1887	38	38	38	39	39	39	40	40	40	41	41	41
1888	42	42	42	43	43	43	44	44	44	45	45	45
1889	46	46	46	47	47	47	48	48	48	49	49	49
1890	50	50	50	51	51	51	52	52	52	53	53	53
1891	54	54	54	55	55	55	56	56	56	57	57	57
1892	58	58	58	59	59	59	60	60	60	61	61	61
1893	62	62	62	63	63	63	64	64	64	65	65	65
1894	66	66	66	67	67	67	68	68	68	69	69	69
1895	70	70	70	71	71	71	72	72	72	73	73	73
1896	74	74	74	75	75	75	76	76	76	77	77	77
1897	78	78	78	79	79	79	80	80	80	81	81	81
1898	82	82	82	83	83	83	84	84	84	85	85	85
1899	86	86	86	87	87	87	88	88	88	89	89	89
1900	90	90	90	91	91	91	92	92	92	93	93	93
1901	94	94	94	95	95	95	96	96	96	97	97	97
1902	98	98	98	99	99	99	100	100	100	101	101	101
1903*	102	102	103	103	104	104	105	105	106	106	107	108
1904	108	108	109	109	110	110	111	111	112	112	113	113
1905	114	114	115	115	116	116	117	117	118	118	119	119
1906	120	120	121	121	122	122	123	123	124	124	125	125
1907	126	126	127	127	128	128	129	129	130	130	313	131
1908	132	132	133	133	134	134	135	135	136	136	137	137
1909*	138	139	140	141	142	143	144	145	146	147	148	149
1910	150	151	152	153	154	155	156	157	158	159	160	161
1911	162	163	164	165	166	167	168	169	170	171	172	173
1912	174	175	176	177	178	179	180	181	182	183	184	185
1913	186	187	188	189	190	191	192	193	194	195	196	197
1914	198	199	200	201	202	203	204	205	206	207	208	209
1915	210	211	212	213	214	215	216	217	218	219	220	221
1916	222	223	224	225	226	227	228	229	230	231	232	233
1917	234	235	236	237	238	239	240	241	242	243	244	245
1918	246	247	248	249	250	251	252	253	254	255	256	257
1919	258	259	260	261	262	263	264	265	266	267	268	269
1920	270	271	272	273	274	275	276	277	278	279	280	281
1921	282	283	284	285	286	287	288	289	290	291	292	293
1922	294	295	296	297	298	299	300	301	302	303	304	305
1923	306	307	308	309	310	311	312	313	314	315	316	317
1924	318	319	320	321	322	323	324	325	326	327	328	329
1925	330	331	332	333	334	335	336	337	338	339	340	341

Calendar Table of Official Gazette Volume Numbers
Month-by-Month Volume Numbers: Jan. 1872 to Present—Continued

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1926	342	343	344	345	346	347	348	349	350	351	352	353
1927	354	355	356	357	358	359	360	361	362	363	364	365
1928	366	367	368	369	370	371	372	373	374	375	376	377
1929	378	379	380	381	382	383	384	385	386	387	388	389
1930	390	391	392	393	394	395	396	397	398	399	400	401
1931	402	403	404	405	406	407	408	409	410	411	412	413
1932	414	415	416	417	418	419	420	421	422	423	424	425
1933	426	427	428	429	430	431	432	433	434	435	436	437
1934	438	439	440	441	442	443	444	445	446	447	448	449
1935	450	451	452	453	454	455	456	457	458	459	460	461
1936	462	463	464	465	466	467	468	469	470	471	472	473
1937	474	475	476	477	478	479	480	481	482	483	484	485
1938	486	487	488	489	490	491	492	493	494	495	496	497
1939	498	499	500	501	502	503	504	505	506	507	508	509
1940	510	511	512	513	514	515	516	517	518	519	520	521
1941	522	523	524	525	526	527	528	529	530	531	532	533
1942	534	535	536	537	538	539	540	541	542	543	544	545
1943	546	547	548	549	550	551	552	553	554	555	556	557
1944	558	559	560	561	562	563	564	565	566	567	568	569
1945	570	571	572	573	574	575	576	577	578	579	580	581
1946	582	583	584	585	586	587	588	589	590	591	592	593
1947	594	595	596	597	598	599	600	601	602	603	604	605
1948	606	607	608	609	610	611	612	613	614	615	616	617
1949	618	619	620	621	622	623	624	625	626	627	628	629
1950	630	631	632	633	634	635	636	637	638	639	640	641
1951	642	643	644	645	646	647	648	649	650	651	652	653
1952	654	655	656	657	658	659	660	661	662	663	664	665
1953	666	667	668	669	670	671	672	673	674	675	676	677
1954	678	679	680	681	682	683	684	685	686	687	688	689
1955	690	691	692	693	694	695	696	697	698	699	700	701
1956	702	703	704	705	706	707	708	709	710	711	712	713
1957	714	715	716	717	718	719	720	721	722	723	724	725
1958	726	727	728	729	730	731	732	733	734	735	736	737
1959	738	739	740	741	742	743	744	745	746	747	748	749
1960	750	751	752	753	754	755	756	757	587	759	760	761
1961	762	763	764	765	766	767	768	769	770	771	772	773
1962	774	775	776	777	778	779	780	781	782	783	784	785
1963	786	787	788	789	790	791	792	793	794	795	796	797
1964	798	799	800	801	802	803	804	805	806	807	808	809
1965	810	811	812	813	814	815	816	817	818	819	820	821
1966	822	823	824	825	826	827	828	829	830	831	832	833
1967	834	835	836	837	838	839	840	841	842	843	844	845
1968	846	847	848	849	850	851	852	853	854	855	856	857
1969	858	859	860	861	862	863	864	865	866	867	868	869
1970	870	871	872	873	874	875	876	877	878	879	880	881
1971	882	883	884	885	886	887	888	889	890	891	892	893
1972	894	895	896	897	898	899	900	901	902	903	904	905
1973	906	907	908	909	910	911	912	913	914	915	916	917
1974	918	919	920	921	922	923	924	925	926	927	928	929
1975	930	931	932	933	934	935	936	937	938	939	940	941
1976	942	943	944	945	946	947	948	949	950	951	952	953
1977	954	955	956	957	958	959	960	961	962	963	964	965
1978	966	967	968	969	970	971	972	973	974	975	976	977
1979	978	979	980	981	982	983	984	985	986	987	988	989
1980	990	991	992	993	994	995	996	997	998	999	1000	1001
1981	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013
1982	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025
1983	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037
1984	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049
1985	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061
1986	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073
1987	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085
1988	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097
1989	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109
1990	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121

* SUMMARY OF CHANGES IN VOLUME NUMBERING:

Semi-annual:	*Jan. 1872 through Jun. 1883*
Quarterly:	*Jul. 1883 through Dec. 1902*
Bi-monthly:	*Jan. 1903 through Dec. 1908*
Monthly:	*Jan. 1909 to the present*

The *Official Gazette* was published on successive Wednesdays from 3 Jan. 1872 through 17 Jan. 1872. From 23 Jan. 1872 to the present, it has been published weekly on Tuesday.

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Part 1

[Docket No. 50725–5025]

Revision of Patent Fees

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: The Patent and Trademark Office is amending the rules of practice in patent cases, Part 1 of title 37, Code of Federal Regulations to adjust fee amounts. This action is necessary at this time because operating costs have increased over the past three years and the Commissioner is authorized by section 41(f) of title 35, United States Code, to adjust fees established in section 41(a) and section 41(b) of title 35, United States Code, on October 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index. Fees for other processing, services or materials related to patents as provided by section 41(d) and section 376 of title 35, United States Code, are being adjusted to recover the estimated average cost of the Office of such processing, services or materials.

EFFECTIVE DATE: October 5, 1985.

FOR FURTHER INFORMATION CONTACT: Frances Michalkewicz by telephone at (703) 557–1610 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This rule change is designed primarily to adjust patent fees because costs have increased and the Commissioner is authorized to: (1) Adjust statutory patent fees set forth in section 41(a) and section 41(b) of title 35, United States Code, to reflect fluctuations occurring during the previous three years in the Consumer Price Index (CPI), as authorized by section 41(f) of title 35, United States Code; (2) adjust fees for processing, services, or materials related to patents which have been established by the Commissioner in accordance with section 41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing, services or materials; and (3) adjust fees for filing and processing an application under the Patent Cooperation Treaty which have been established by the Commissioner to recover the estimated average cost of such processing in accordance with section 376 of title 35, United States Code.

Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks were not proposed at this time, pending review of trademark automation cost requirements.

A notice of proposed rulemaking was published in the **Federal Register** on June 21, 1985, at 50 FR 25896–25902. Corrections of typographical errors were published on July 1, 1985, at 50 FR 27030, and on July 15, 1985, at 50 FR 28596. The notice also was published in the *Official Gazette* on July 2, 1985, at Volume 1056, pages 6 through 25. An oral hearing was held on July 18, 1985. Fifteen written letters and statements were submitted. One person testified at the oral hearing. Full consideration has been given to all of these letters, statements, and testimony.

Background Information

Patent and Trademark Office fees are authorized by sections 41 and 376 of title 35, United States Code. Section 41(a) of title 35, United States Code, establishes a number of statutory fees. Among the more significant of these are fees for filing a patent application and issuing a patent. Certain other fees, such as appeal fees, the fee for filing a disclaimer, fees for filing petitions seeking to revive an abandoned application and for extensions of time also are set in section 41(a) of title 35, United States Code. Section 41(b) of title 35, United States Code, sets forth the statutory fees for maintaining a patent in force if the application was filed on or after August 27, 1982.

The provisions of Public Law 96–517 also authorize maintenance fees for applications other than design and plant patent applications filed on or after December 12, 1980 and before August 27, 1982. These maintenance fees are to recover 25 percent of the estimated cost to the Office of processing patent applications.

Section 1 of Pub. L. 97–247 authorized the reduction by 50 percent in the fees paid under section 41(a) and section 41(b) of title 35, United States Code, by independent inventors, small business concerns, and nonprofit organizations, who meet the definitions established. This authorization will expire on September 30, 1985. Legislation has been introduced to authorize this reduction for an additional three years. If such authority is not continued, the small entity reduction will be rescinded and appropriate amendments to the regulations will be made.

Section 41(f) of title 35, United States Code, provides that fees established in section 41(a) and section 41(b) of title 35, United States Code, "may be adjusted by the Commissioner on October 1, 1985, and every third year thereafter, to reflect any fluctuations occurring during the previous three years in the Consumer Price Index, as determined by the Secretary of Labor." Section 41(f) also provides that changes of less than one percent may be ignored.

Policy for Applying the Consumer Price Index

The Department of Labor's Consumer Price Index (CPI) is made public approximately twenty-one days after the end of the month being calculated. The time lag between the initiation and the completion of the rulemaking process dictated that the March through September 1985 inflation rate be projected in the original rulemaking proposal. This estimate resulted in a cumulative three-year CPI of 11.7 percent applied to patent fees.

Based upon actual data through June 1985 and projecting the CPI to September 30, 1985, the Administration's revised projected cumulative CPI for the three-year (1982–1985) period is 11.8 percent. The Patent and Trademark Office has used the 11.8 percent projection in adjusting the fees established in section 41(a) and section 41(b) of title 35, United States Code. The revised CPI projection has not caused a change from the proposal in any of the section 41(a) and section 41(b) fees.

After application of the 11.8 percent projected fluctuation in the CPI to fees set forth in section 41(a) and section 41(b), amounts for all non-small entity fees were rounded by applying standard arithmetical rules so that the amounts rounded would be de minimis and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees below $100 were rounded to the nearest even number so that all comparable small entity fees would be in whole numbers. Section 41(d) of title 35, United States Code, provides that the "Commissioner will establish fees for all other processing, services, or materials related to patents" which are not covered in section 41(a) and section 41(b) of title 35, United States Code, "to recover the estimated average cost to the Office of such processing, services or materials."

Section 376 of title 35, United States Code, authorizes the Commissioner to set fees for patent applications filed under the Patent Cooperation Treaty. The fees under the Patent Cooperation

Treaty are keyed to full cost recovery of the processing costs under the Treaty.

The general guidelines used by the Patent and Trademark Office in determining the non-statutory fees are set forth in OMB Circular A-25. Costs were determined from the best available records and included direct and indirect costs to the Office of carrying out the activity.

Since these non-statutory fees are expected to remain in place for the three year fee cycle 1986–1988, the calculated costs were then adjusted by a mid-cycle inflation rate of 6.21 percent derived from the Administration's inflation projection. After application of the projected mid-cycle inflation rate, amounts were rounded by applying standard arithmetical rules so that the amounts rounded would be de minimis and convenient to the user. Fees of $100 or more were rounded to the nearest $10. Fees between $2 and $99 were rounded to the nearest whole number. Fees under $2 were rounded for convenience.

The fees established under section 41(d) and section 376 of title 35, United States Code have been modified from the proposal. For the first fee cycle (1983–1985), fees established under section 41(d) and section 376 were set in the aggregate to recover the estimated average cost to the Office of processing, services and materials as defined in PTO budget documents. Because of the significant increase in fees that was instituted on October 1, 1982, as well as the establishment of new fees, the PTO did not have the necessary experience to accurately predict (nor could it control) fee volumes for the first fee cycle. First cycle fees were thus set at levels sufficient to maintain financial solvency despite possible fluctuations in costs or in workload. Fee amounts in most cases also were set at convenient integers (e.g., $5 to $10). For the second fee cycle (1986–1988), the PTO had proposed to set fees established under section 41(d) and section 376 using the same methodology. Several comments to the proposed rules suggested that the PTO should establish section 41(d) and section 376 fees to more precisely recover the estimated average cost to the Office of the processing, service or material. The fees have been modified to reflect the following: (1) PTO experience over the past two and one-half years in predicting fee volumes, (2) virtual elimination of the reserve income for fluctuations in cost or workload, and (3) greater reliance upon and use of the individual fee costs developed by the PTO's Office of Finance.

It is intended that the amount of any fee due and payable on or after October 5, 1985 is the amount set in this rulemaking. For purposes of determining the amount of the fee to be paid, the date of mailing indicated on a proper Certificate of Mailing, where authorized under § 1.8 of title 37, Code of Federal Regulations, will be considered to be the date of receipt in the Office. A "Certificate of Mailing under § 1.8" is *not* "proper" for items which are specifically excluded from the provisions of § 1.8. Section 1.8 of title 37, Code of Federal Regulations, should be consulted for those items for which a Certificate of Mailing is *not* "proper". Such items include, *inter alia*, the filing of national and international applications for patents and the filing of trademark applications. The provisions of § 1.10 of title 37, Code of Federal Regulations relating to filing of papers and fees by "Express Mail" with certificate, however, do apply to *any paper or fee* (including patent and trademark applications) to be filed in the Office. If an application or fee is filed by "Express Mail" with a certificate of mailing dated on or after October 5, 1985, the amount of the fee to be paid is the fee established herein if a change is being made in the fee.

It is further intended that the amount due and payable for services provided in Fiscal Year 1986 will be the amount set in this rulemaking even if the fee becomes due prior to October 5, 1985. Such fees include, but are not limited to, the annual service charge for subscription services (§ 1.19(c)(1)) and the annual rental for a delivery box (§1.21(d)).

In order to ensure clarity in the implementation of the fee proposals, a discussion of specific sections is set forth below:

Discussion for Specific Rules

Section 1.16 National application filing fees

Section 1.16 is amended to adjust patent application filing fees established in section 41(a) of title 35, United States Code and set forth in paragraphs (a)–(d) and (f)–(j) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.16, paragraph (e) is amended to adjust the patent application surcharge fee authorized by section 111 of title 35, United States Code. Paragraph (e) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.17 Patent application processing fees

Section 1.17 is amended to adjust patent application processing fees established in section 41(a) of title 35, United States Code, and set forth in paragraphs (a)–(g), (l) and (m) of this section to reflect fluctuations in the Consumer Price Index. The wording of paragraph (l) has been broadened to include reference to applications abandoned under section 371(d) of title 35, United States Code.

Section 1.17, paragraphs (h)–(k) are amended to adjust the patent application processing fees authorized by section 41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing. Paragraphs (h)–(k) have been modified from the proposal to more precisely recover the estimated average cost to the Office of processing petitions to the Commissioner, public use proceedings, and non-English language specifications.

Section 1.18 Patent issue fees

Section 1.18 is amended to adjust patent issue fees established in section 41(a) of title 35, United States Code and set forth in paragraphs (a)–(c) of this section to reflect fluctuations in the Consumer Price Index.

Section 1.19 Document supply fees

Section 1.19 is amended to adjust the fees authorized by 41(d) of title 35, United States Code for services and materials as set forth in paragraph (a)–(c), (e) and (f) of this section to recover the estimated average cost to the Office of the specified services and materials. Paragraphs (a)–(c) have been modified from the proposal to more precisely recover the estimated average cost to the Office of supplying the documents specified in these paragraphs. Section 1.19 has been modified further to reduce the fees specified in paragraphs (e) and (f), which were not proposed for adjustment to more precisely recover the estimated average cost to the Office of supplying the documents.

Section 1.19, paragraph (a) is amended further to clarify the services and documents provided. It would provide for copies of specific documents at a flat fee. Copies of general Office records would be provided at a per page fee. Paragraph (a)(4) has been modified from the proposal to provide copies of a patent file wrapper and its contents at $75 for each 200 pages or a fraction thereof.

Section 1.19, paragraph (b) is amended further to delete subparagraph (3). A flat fee for comparing and certifying copies of documents made

from Office records is provided in new paragraph (i) of this section.

Section 1.19, paragraph (c) is amended further to provide for ten subclasses with the annual service charge.

Section 1.19 is amended to provide in new paragraph (h) a $10 per document flat fee for an uncertified copy of a non-United States patent document. This fee would apply to copies of foreign patent applications such as those which are published at 18 months or when allowable for opposition.

Section 1.19 is amended to provide in new paragraph (i) a flat fee for comparison and certification of each copy of a document made from Office records but not prepared by the Office.

Section 1.19 is amended to provide in new paragraph (j) a fee for duplicate filing receipts and corrected filing receipts due to applicant error.

Paragraphs (i) and (j) have been modified from the proposal to more precisely recover the estimated average cost to the Office of supplying the documents specified.

Section 1.20 Post-issuance fees

Section 1.20, paragraphs (a)–(c) are amended to adjust patent post-issuance fees authorized by section 41(d) of title 35, United States Code, to recover the estimated average cost to the Office of such processing. Section 1.20 has been modified from the proposal to more precisely recover the estimated average cost to the Office of the post-issuance fees set forth in paragraphs (b)–(c). Section 1.20 has been modified further to reduce the fee set forth in paragraph (a), which was not proposed for adjustment, to more precisely recover the estimated average cost to the Office of providing a certificate of correction.

Section 1.20, paragraphs (d) and (h)–(j), are amended to adjust patent post-issuance fees established in section 41(a) and section 41(b) of title 35, United States Code, to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraphs (e)–(g), are amended to adjust post-issuance fees authorized by section 2 of Public Law 96–517, as modified by section 404 of Public Law 98–622. These fees must be set at a level to eventually recover 25 percent of the estimated cost to the Office of processing patent applications. In order to achieve this level of recovery, these maintenance fees are adjusted to reflect fluctuations in the Consumer Price Index.

Section 1.20, paragraph (k), is amended to adjust the patent maintenance surcharge fee authorized by section 2 of Public Law 96–517. Paragraph (k) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.20, paragraph (l), is amended to adjust the post-issuance fee authorized by section 41(b) of title 35, United States Code. Paragraph (l) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index.

Section 1.21 Miscellaneous fees and charges

Section 1.21 is amended to adjust the miscellaneous fees and charges authorized by section 41(d) of title 35, United States Code and set forth in paragraphs (a)-(f), (h) and (i) of this section to recover the estimated average cost to the Office of such processing. Section 1.21 has been modified from the proposal to more precisely recover the estimated average cost to the Office of the miscellaneous services for which fees were set forth in paragraphs (a)(2)-(a)(6), (b)(1), (d)-(f), (h)(1) and (i). Section 1.21 has been modified further to reduce the fees specified in paragraphs (c) and (h)(2), which were not proposed for adjustment, to more precisely recover the estimated average cost to the Office of those services.

Section 1.21, paragraph (g), is modified from the proposal to change the term "copy machine tokens" to "CopiShare card."

Section 1.21, paragraph (k), is amended to change the word "section" to "part" to clarify that any charge not provided for in these rules would be made at actual cost.

Section 1.21 is amended to provide in new paragraph (m) a $20 fee for processing checks returned "unpaid" by a bank.

Section 1.24 Coupons

Section 1.24 is amended to adjust the fees for the purchase of coupons for patents to make it comparable to the fee required for the purchase of U.S. patents.

Section 1.24 is amended to delete references to forty cent coupons which are no longer sold by the Patent and Trademark Office.

Section 1.25 Deposit accounts

Section 1.25 is amended to establish a restricted subscription deposit account to be used exclusively for subscription orders of patent copies as issued. A minimum deposit of $300 is required to establish and maintain, without payment of a monthly service fee, a restricted subscription deposit account.

Section 1.26 Refunds

Section 1.26 is amended to change paragraph (c) to provide for a refund of $1,300 if the Commissioner decides not to institute reexamination proceedings. The $1,300 refund would apply to those instances where the reexamination fee of $1,770 under § 1.20(c) was paid. The current $1,200 refund will be made in those cases where the current $1,500 reexamination fee was paid.

Section 1.53 Serial number, filing date, and completion of application

Section 1.53 is amended to change paragraph (c) to reduce to $15 the handling fee charged in the event a specification or drawing is not submitted within the time period set by the Office. Section 1.53 has been modified to more precisely recover the estimated average cost to the Office of handling an application with missing parts.

Section 1.297 Publication of statutory invention registration

Section 1.297, paragraph (b), is amended to modify the statement to be printed on each statutory invention registration. The language of the statement is modified so as to be more easily understood.

Section 1.445 International application filing and processing fees

Section 1.445, paragraphs (a)(1), (a)(4), are amended to adjust the fees authorized by section 376 of title 35, United States Code, for international application processing to recover the estimated average cost to the Office of such processing. The cost of the international search fee set forth in § 1.445(a)(2)(i) has been reduced and the amount credited by the Office under § 1.445(a)(2)(ii) is not changed. Paragraphs (a)(1) and (a)(3) have been modified from the proposal to more precisely recover the estimated average cost to the Office of processing international applications. However, the amount of the credit under § 1.445(a)(4) is somewhat less than at present and is the same as in the proposed rules.

Section 1.445(a)(5) is amended to adjust the surcharge authorized by section 371(d) of title 35, United States Code.

Paragraph (a)(5) has been modified from the proposal to limit the adjustment to the surcharge fee to changes which occurred during the past three years in the Consumer Price Index and to provide for a small and large entity amount to be consistent with § 1.16(e).

Section 1.445(a)(6) is amended to adjust the processing fee for an English translation filed after 20 months from the priority date to recover the estimated average cost to the Office of such processing. Paragraph (a)(6) has been modified from the proposal to more precisely recover the estimated average cost to the Office of processing an English translation and to be consistent with § 1.17(k).

Section 1.448 Refund of international application filing and processing fees.

Section 1.448 is amended to delete paragraph (b). The substance of the deleted material is included in § 1.445, paragraph (a)(4).

Response to Comments on the Rules

Specific comments were received on a number of the proposed rule changes. Fifteen letters submitting written comments and eight questions by telephone were received. Oral testimony was presented by one person at the public hearing conducted on July 18, 1985. All of the written and oral comments were considered in adopting the changes set forth herein. The comments submitted appear below along with responses thereto.

Comment: PTO fees are already too high and burdensome to the patent community.

Reply: There has been no indication that PTO fees are burdensome to the patent community. In 1984, we expected to receive 107,000 patent applications and actually received 109,539. In 1985, we are currently receiving applications at an annual rate of approximately 116,000.

The PTO is adjusting patent processing and patent service fees because costs have increased. The Commissioner may adjust patent statutory fees by changes which have occurred during the past three years in the Consumer Price Index (CPI). This authority is provided by 35 U.S.C. 41(f). The intent of the Congress in indexing the statutory patent fees set in 1982 to the CPI was to assure that a precipitous drop in the level of recovery did not occur due to inflation. Indexing of statutory patent fees was not intended to raise additional revenues beyond the rate of inflation.

The Commissioner also is authorized to adjust non-statutory patent fees to recover the estimated average cost to the Office of processing, services and materials. This authority is provided by 35 U.S.C. 41(d). As previously discussed, several of the proposed fees have been modified to more precisely recover the estimated average cost to the Office of processing, materials and services.

Comment: PTO has failed to abide by the provisions of Pub. L. 96–517 and the accompanying report (House Report 96–1307). Specifically, the PTO has failed to abide by the 50 percent recovery limitation for patent processing fees and the restrictions on the use of fee income.

Reply: Pub. L. 96–517, although enacted into law, was never fully implemented because the Congress passed H.R. 6260 which was enacted as Pub. L. 97–247 on August 27, 1982. Pub. L. 97–247 provides for an eventual 100 percent cost recovery through processing and maintenance fees except for the subsidy for certain small entities, and contains no restrictions on the use of income from fee revenues.

This rulemaking adjusts, by the Consumer Price Index (CPI), the patent processing (41(a)) and patent maintenance (41(b)) fees established by Pub. L. 97–247. The CPI adjustment allows the programs supported by sections 41 (a) and (b) fees to keep pace with inflation. Any growth in the aggregate rate of recovery of fees versus costs in this second cycle of fees is due primarily to the first time collection of maintenance fee receipts.

The restrictions on the use of income from fee revenues, which were included in House Report 96–1307 accompanying Pub. L. 96–517, were based upon a 50 percent recovery of patent costs from user fees. Then-Commissioner Mossinghoff testified before the Subcommittee on Courts, Civil Liberties, and Administration of Justice, when Congress was considering H.R. 6260, that the Administration's PTO user fee program was proposed to improve the quality of service at the PTO by reducing patent pendency, trademark pendency and automating patent and trademark operations. The Commissioner went on to say that "The major increases in the three program areas will be paid for by the sharp increase in user fees that we are recommending." The Congressional debate on this proposal indicates that the Subcommittee approved these innovative fee provisions in order to improve the level of patent and trademark services provided to users of the office.

Comment: Fees should relate to the actual "costs of processing patent applications" and should not include "overhead" expenses.

Reply: The fees applicable to patent filing, issuance and maintenance fees were established by the Congress and set forth in 35 U.S.C. sections 41 (a) and (b). Regardless if Congress included "overhead" expenses when setting these statutory patent fees, these fees may be adjusted only to reflect the fluctuations in the CPI every three years. Fees for other processing, services or materials related to patents are set by the Commissioner pursuant to 35 U.S.C. 41(d) to recover the Office's estimated average cost. The legislative history of Pub. L. 97–247, including the accompanying House Report, does not provide guidance regarding how "estimated average cost" was to be determined. These fees were determined under the general guidelines of OMB Circular A–25, entitled "User Charges," which establishes general policies for developing an equitable and uniform system of charges for certain government services and property. Circular A–25 provides that a reasonable charge should be imposed to recover the full cost to the Government of rendering a service to an identifiable recipient, who receives a substantial benefit not accruing to the general public, e.g., receiving a patent. The concept of full cost recovery includes an appropriate overhead charge. Therefore, the inclusion of overhead expenses in calculating the costs of processing patent applications is appropriate.

Comment: The PTO does not include a description of any cost containment measure.

Reply: The PTO has taken all possible measures to contain costs. During fiscal year 1985, a zero-based analysis was conducted of all programs and their associated funding. The purpose of the review was to assure that adequate resources were available to meet the PTO's most important priorities while addressing unanticipated costs such as, the full absorption of the fiscal year 1985 pay raise, new pay scale for patent examiners, higher postal and telephone rates, greater use of PTO services, etc. The PTO's annual budget request is thoroughly reviewed by the Department of Commerce, by the Office of Management and Budget, and by the Congressional Appropriations Committees prior to enactment. The PTO is complying with the President's Deficit Reduction Program. The fiscal year 1986 budget request reflects reductions to travel, printing and consultants as required by the Deficit Reduction Act of 1984; administrative cost savings; and grade reductions and pay cuts. The PTO program to reduce patent pendency, once achieved in 1987, will require less resources than are currently expended. The Automation program, too, as it achieves its major milestones, will deliver cost benefits.

Comment: The PTO has proposed to adjust fees because costs have increased but they did not include an

explanation of how costs were calculated.

Reply: Patent statutory fees, which are set forth in 35 U.S.C. 41 (a) and (b), can be adjusted on October 1, 1985 and every three years thereafter to reflect fluctuations which have occurred in the Consumer Price Index (CPI). The costs of processing a patent application from receipt to issue or abandonment were calculated in 1982 at the time the present fees were set by statute. The most significant elements of processing a patent application are compensation costs, space and the costs incurred for printing the *Official Gazette* and patent grants.

As a result of these increases to the major costs incurred in the processing of a patent application, the PTO is adjusting the statutory 41 (a) and (b) patent fees by the full CPI of 11.8 percent in order to recover the projected budgeted collections for patent processing for the years 1986–1988.

Non-statutory patent and patent service fees are being set to recover the estimated average cost to the Office over the next three years (1986–1988) of processing, services and materials. Costs for goods and services were determined under the general guidelines set forth in OMB Circular A–25 entitled "User Charges," which establishes general policies for developing an equitable and uniform system of charges for certain Government services and property. The cost of all processing, services and/or materials associated with each non-statutory (section 41(d)) patent fee was determined. Since these fees are expected to remain in place for three years (1986–1988), each cost was adjusted by a mid-cycle inflation rate of 6.21 percent which was derived from the Administration's 1986–1988 inflation projection.

Comment: The PTO has proposed to set section 41(d) fees at a level which exceeds the estimated average cost to the Office. PTO's cost calculations do not support the proposed section 41(d) fees.

Reply: Fees established pursuant to 35 U.S.C. 41(d) and 376, non-statutory patent and patent service fees, are being set to recover the estimated average cost to the Office over the next three years (1986–1988) of processing, services and materials. Costs for goods and services were determined under the general guidelines set forth in OMB Circular A–25 entitled "User Charges," which establishes general policies for developing and equitable and uniform system of charges for certain Government services and property.

The PTO employed cost-finding techniques for determining the costs of all processing, services and/or materials associated with each non-statutory patent fee. These costs were documented by the Director, Office of Finance and reviewed by each responsible Assistant Commissioner. Since the revised fees are expected to remain in place for the next three years (1986–1988), each cost was adjusted by the mid-cycle inflation rate of 6.21 percent. The fee was then set based upon this inflated cost.

For the first fee cycle (1983–1985), fees established under section 41(d) and section 376 were set in the aggregate to recover the estimated average cost to the Office of processing, services and materials as defined in PTO budget documents. Because of the significant increase in fees that was instituted on October 1, 1982, as well as the establishment of new fees, the PTO did not have the necessary experience to accurately predict (nor could it control) fee volumes for the first fee cycle. First cycle fees were thus set at levels sufficient to maintain financial solvency despite possible fluctuations in costs or in workload. Fee amounts in most cases also were set at convenient integers (e.g., $5 or $10). For the second fee cycle (1986–1988), the PTO had proposed to set fees established under section 41(d) and section 376 using the same methodology. Several comments to the proposed rules suggested that the PTO should establish section 41(d) and section 376 fees to more precisely recover the estimated average cost to the Office of the processing, service or material. The fees have been modified to reflect the following: (1) PTO experience over the past two and one-half years in predicting fee volumes; (2) virtual elimination of the reserve income for fluctuations in cost or in workload; and (3) greater reliance upon and use of the individual fee costs developed by PTO financial analysts.

In modifying the proposed fees, the PTO used the raw cost data derived for each fee, adjusted that amount by the projected mid-cycle inflation rate of 6.21 percent, and rounded the adjusted cost by applying standard arithmetical rules. Fees of $100 or more were rounded to the nearest $10. Fees between $99 and $2 were rounded to the nearest whole number. Fees under $2 were rounded for convenience.

Comment: The increase in maintenance fees appears to be driven by non-cost considerations. Since they have just begun to be collected, there could be no actual cost histories on which to base the adjustments.

Comment: The increases in claims fees seem to be proposed without any seemingly real increase in cost specifically attributable to these items.

Reply: Patent statutory fees such as claim and maintenance fees, which are set forth in 35 U.S.C. 41 (a) and (b), may be adjusted every three years to reflect changes which have occurred in the Consumer Price Index (CPI) for the prior three years. The costs of processing, issuing and maintaining patents were calculated in 1982 at the time the present fees were set by statute. Patent maintenance fees as set forth in both Public Laws 96–517 and 97–247 are one of several sources of income available to the PTO to cover the costs of processing, issuing and maintaining a patent. The most significant elements of processing, issuing and maintaining patents are personnel compensation, benefits, space and printing costs. Since 1982, these costs have risen in an amount equal to and in some cases, in an amount exceeding, the CPI increase for the individual year.

As a result of these cost increases, the PTO is adjusting section 41(a) and section 41(b) patent fees and the Public Law 96–517 maintenance fees by the full CPI of 11.8 percent.

Comment: PTO's proposed adjustments to section 41(a) and section 41(b) fees are higher than the 11.7 percent fluctuation in the Consumer Price Index because of the rounding principles PTO has applied.

Reply: The intent of the Congress in indexing the statutory patent fees, 35 U.S.C. 41 (a) and (b), to the CPI was to assure that a precipitous drop in the level of recovery did not occur due to inflation with regard to the fees set in 1982. Indexing of statutory patent fees was not intended to be a method of raising additional revenues, nor has the PTO used it for that purpose, but rather for administrative ease. Rounding will ease the administration of these fees by permitting the PTO and users to deal in increments of ten when the adjusted fee is $100 or greater or in even amounts when the fee is below $99. This will ease implementation of the 50 percent reduction in fees for small businesses, non-profit organizations and individuals. Moreover, any surpluses which may result are for the short-term only. By applying routine rounding techniques, there should be a balancing out of shortfalls and surpluses in the long-run.

Comment: The fee for a deferred declaration under 35 U.S.C. 111 should be changed so that such a fee would only be required if the declaration were filed later than three months from the actual filing date.

Reply: The suggestion for permitting the declaration to be filed up to three

months after the actual filing date without a surcharge has not been adopted. It would place administrative burdens on the Office since it would encourage the late filing of oaths or declaration.

Comment: There appears to be no justification for the significant increase to the surcharge fees.

Reply: In proposing adjustments to penalty surcharge fees, the PTO considered the costs incurred in providing special handling to certain cases, and proposed to set the fee at a level that would recover costs and preclude unnecessary resort to pertinent procedures but not so high as to be burdensome where resort to these procedures is necessary. In response to several comments received on the proposed surcharge fees, the proposal has been modified to limit the adjustments to surcharge fees set forth in § 1.16(e), § 1.20(k), § 1.20(l) and § 1.445(a)(5) to changes which have occurred during the past three years in the Consumer Price Index.

Comment: Patent Cooperation Treaty (PCT) fee increases far exceed the 11.7 percent average increase applied to national applications. This increase could seriously affect use of PCT system.

Reply: The PCT fees set under 35 U.S.C. 376 are based on cost recovery and are not adjusted by the Consumer Price Index. The fees under § 1.445 are set to reflect estimated average processing costs. A reduction was made in the amount of the international search fee if performed by the U.S. Patent and Trademark Office. While the credit for a prior U.S. search is unchanged and other PCT fees are increased, the overall adjustment level of PCT fees is generally in line with the CPI.

Comment: The small entity reduction should be adopted for the PCT surcharge.

Reply: The final rule has been modified from the proposal to provide for small and large entity amounts in § 1.445(a)(5). This is to correspond to a similar fee in § 1.16(e).

Comment: The proposed fees for a copy of a patent file wrapper and its contents (§ 1.19(a)(4)) are unfair at the breakpoint. It would be more equitable to charge $75 for each 200 pages or fraction thereof.

Reply: In proposing a fee of $75 for up to 200 pages and $350 for 201 pages or more for a copy of a patent file wrapper and its contents, the PTO was attempting to move to a flat fee for this service. Since there were objections to the breakpoint, the final rule has been modified from the proposal to reflect a fee of $75 for each 200 pages or fraction thereof.

Comment: The proposed increase in § 1.20(c) regarding requests for reexamination and the related decrease in § 1.26(c) relating to refunds where reexamination is not ordered, appeared to be set from a revenue generating standpoint rather than being cost-driven.

Reply: While the comment does not suggest what the fees should be, it is noted that the two fees have to be considered together. The notice of proposed rulemaking set a fee of $1,800 for filing a request for reexamination, which was an increase from the previous fee of $1,500. This fee has been modified from the proposal and is now set at $1,770. The refund where reexamination is denied was proposed to be raised from $1,200 to $1,300, which raises the refund from the amount previously refunded. The amount refunded has not changed from the proposal. The relative amounts of the initial fee and the refund are set to obtain the necessary recovery of costs from reexamination.

Comment: A separate schedule of fees should be instituted for interference proceedings, but such fees should apply only to junior parties, since interferences are conducted primarily for their benefit.

Reply: The rules already provide for certain fees relating to interference proceedings; see § 1.644 (e) and (f), and § 1.666 (b) and (c). In general, however, the PTO decided in 1982 that the costs of interference proceedings should be factored into the fees charged in connection with the processing and examination of patent applications, because: (1) An interference is a proceeding instituted by the PTO; and (2) it would not be administratively feasible to attempt to provide a fee schedule to cover the myriad of different situations which may occur in the course of an interference. Since these reasons are still considered applicable, the suggestion has not been adopted.

Comment: The proposed fee for admission to the examination (§ 1.21(a)(1)) for registration to practice is too high for students who often sit for the exam and it is inappropriate because administering the exam is not a service to the public but a cost of operating the PTO.

Reply: The fee for admission to the examination for registration to practice reflects the costs of conducting the examination twice a year nationwide. The significant increase is due to the fact that the fee had been understated in relation to cost during the 1983–1985 fee cycle. Fees established in this rulemaking will more precisely recover the estimated average cost to the Office of administering and grading the examination and are consistent with the cost recovery principles of OMB Circular A–25.

Comment: The proposed fee for requesting a regrading of an examination (§ 1.21(a)(6)) should be waived if the regrading request was necessitated by a PTO error.

Reply: Any fee may be refunded if paid by mistake or paid in excess of that required. See 35 U.S.C. 42(d).

Comment: The PTO should retain the present fee for admission to the examination to practice before the Office (§ 1.21(a)(1)) and increase the fee payable upon registration to practice (§ 1.21(a)(2)).

Reply: This suggestion has not been adopted in this rulemaking. The fees for admission to the examination and for registration to practice have been set to recover the cost of those services.

Comment: The proposed fee for reviewing a decision of the Director of Enrollment and Discipline (§ 1.21(a)(5)) appears to be low in view of the significant amount of time and effort involved in a review.

Reply: The fee for this service, as modified, recovers the estimated average cost to the Office of providing the service.

Comment: The fees for processing an application filed with a specification in a non-English language (§ 1.17(k)) and for filing an English translation of an international application later than 20 months after the priority date (§ 1.445(a)(6)) appear to be in excess of cost.

Reply: The final rules have been modified from the proposed to provide for a fee of $26, the cost of processing applications filed with non-English language specifications in both domestic and international cases.

Comment: An extension of time to August 16, 1985 for the submission of comments was requested.

Reply: The PTO is required by 35 U.S.C. 41(g) to publish a notice of fee increases in the **Federal Register** at least 60 days prior to the effective date of the fee increase. In order to have the proposed fee increases become effective near the start of the fiscal year, the extension of time could not be granted.

Comment: Why were there no proposals to adjust trademark fees?

Reply: Adjustments to fees for filing and processing a trademark application and for other processing, services or materials related to trademarks were not proposed at this time, pending

review of trademark automation cost requirements.

Comment: De we plan to verify the inflation rate before publication of the final rules?

Reply: The projected inflation rate has been verified. The Administration's latest projected annual cumulative Consumer Price Index for the three year period 1982–1985 is 11.8 percent. Application of this index to § 41(a) and § 41(b) fees results in no change from the proposal.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. There are no information collection requirements relating to patent fee rules.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). The principal impact of the major patent fees has already been taken into account in Pub. L. 97–247, which provided small entities with a 50 percent reduction in the major patent fees. Although that legislation will expire on September 30, 1985, legislation has been introduced to reauthorize the 50 percent reduction in patent fees for an additional three years. The rule change adjusts fees to reflect the change in the Consumer Price Index and cost of processing services as provided by statute (35 U.S.C. 41(d) and 41(f)).

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 41, 111, 157, 302, and 376 and Pub. L. 96–517, 97–247 and 98–622, the Patent and Trademark Office is amending 37 CFR Part 1 as set forth below.

PART 1—[AMENDED]

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.16 is revised to read as follows.

§ 1.16 National application filing fees.

(a) Basic fee for filing each application for an original patent, except design or plant cases:	
By a small entity (§ 1.9(f))	$170.00
By other than a small entity	340.00
(b) In addition to the basic filing fee in an original application, for filing or later presentation of each independent claim in excess of 3:	
By a small entity (§ 1.9(f))	17.00
By other than a small entity	34.00
(c) In addition to the basic filing fee in an original application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20. (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee calculation purposes):	
By a small entity (§ 1.9(f))	6.00
By other than a small entity	12.00
(d) In addition to the basic filing fee in an original application, if the application contains, or is amended to contain, a multiple dependent claim(s), per application:	
By a small entity (§ 1.9(f))	55.00
By other than a small entity	110.00
(If the additional fees required by paragraphs (b), (c) and (d) are not paid on filing or on later presentation of the claims for which the additional fees are due, they must be paid or the claims canceled by amendment, prior to the expiration of the time period set for response by the Office in any notice of fee deficiency.)	
(e) Surcharge for filing the basic filing fee or oath or declaration on a date later than the filing date of the application:	
By a small entity (§ 1.9(f))	55.00
By other than a small entity	110.00
(f) For filing each design application:	
By a small entity (§ 1.9(f))	70.00
By other than a small entity	140.00
(g) Basic fee for filing each plant application:	
By a small entity (§ 1.9(f))	110.00
By other than a small entity	220.00
(h) Basic fee for filing each reissue application:	
By a small entity (§ 1.9(f))	170.00
By other than a small entity	340.00
(i) In addition to the basic filing fee in a reissue application, for filing or later presentation of each independent claim which is in excess of the number of independent claims in the original patent:	
By a small entity (§ 1.9(f))	17.00
By other than a small entity	34.00
(j) In addition to that basic filing fee in a reissue application, for filing or later presentation of each claim (whether independent or dependent) in excess of 20 and also in excess of the number of claims in the original patent. (Note that § 1.75(c) indicates how multiple dependent claims are considered for fee purposes):	
By a small entity (§ 1.9(f))	6.00
By other than a small entity	12.00
(Note, see § 1.445 for international application filing and processing fees).	

(35 U.S.C. 6, 41, 111; Pub. L. 97–247)

3. Section 1.17 is amended by revising paragraphs (a) through (m) to read as follows:

§ 1.17 Patent application processing fees.

(a) Extension fee for response within first month pursuant to § 1.136(a):	
By a small entity (§ 1.9(f))	$28.00
By other than a small entity	56.00
(b) Extension fee for response within second month pursuant to § 1.136(a):	
By a small entity (§ 1.9(f))	85.00
By other than a small entity	170.00
(c) Extension fee for response within third month pursuant to § 1.136(a):	
By a small entity (§ 1.9(f))	195.00
By other than a small entity	390.00
(d) Extension fee for response within fourth month pursuant to § 1.136(a):	
By a small entity (§ 1.19(f))	305.00
By other than a small entity	610.00
(e) For filing a notice of appeal from the examiner to the Board of Patent Appeals and Interferences:	
By a small entity (§ 1.9(f))	65.00
By other than a small entity	130.00
(f) In addition to the fee for filing a notice of appeal, for filing a brief in support of an appeal:	
By a small entity (§ 1.9(f))	65.00
By other than a small entity	130.00
(g) For filing a request for an oral hearing before the Board of Patent Appeals and Interferences in appeal under 35 U.S.C. 134:	
By a small entity (§ 1.9(f))	55.00
By other than a small entity	110.00
(h) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph	140.00
§ 1.47—for filing by other than all the inventors or a person not the inventor.	
§ 1.48—for correction of inventorship.	
§ 1.182—for decision on questions not specifically provided for.	
§ 1.183—to suspend the rules.	
§ 1.295—for review of refusal to publish a statutory invention registration.	
§ 1.377—for review of decision refusing to accept and record payment of a maintenance fee filed prior to expiration of patent.	
§ 1.378(e)—for reconsideration of decision on petition refusing to accept delayed payment of maintenance fee in expired patent.	
§ 1.644(e)—for petition in an interference.	
§ 1.644(f)—for request for reconsideration of a decision on petition in an interference.	
§ 1.656(c)—for late filing of interference settlement agreement.	
§§ 5.12, 5.13, & 5.14—for expedited handling of foreign filing license.	
§ 5.15—for changing the scope of a license.	
§ 5.25—for retroactive license.	
(i) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph	72.00
§ 1.12—for access to an assignment record.	
§ 1.14—for access to an application.	
§ 1.55—for entry of late priority papers.	
§ 1.102—to make application special.	
§ 1.103—to suspend action in application.	
§ 1.177—for divisional reissues to issue separately.	
§ 1.312—for amendment after payment of issue fee.	
§ 1.313—to withdraw an application from issue.	
§ 1.314—to defer issuance of a patent.	
§ 1.334—for patent to issue to assignee, assignment recorded late.	
§ 1.666(b)—for access to interference settlement agreement.	
(j) For filing a petition to institute a public use proceeding under § 1.292	860.00
(k) For processing an application filed with a specification in a non-English language (§ 1.52(d))	26.00
(l) For filing a petition (1) for the revival of an unavoidably abandoned application under 35 U.S.C. 133, or 371 or (2) for delayed payment of the issue fee under 35 U.S.C. 151:	
By a small entity (§ 1.9(f))	28.00
By other than a small entity	56.00

(m) For filing a petition (1) for revival of an unintentionally abandoned application or (2) for the unintentionally delayed payment of the fee for issuing a patent:

By a small entity (§ 1.19(f))	280.00
By other than a small entity	560.00

(35 U.S.C. 6, 41, 157, 376; Pub. L. 97–247)

4. Section 1.18 is revised to read as follows:

§ 1.18 Patent issue fees.

(a) Issue fee for issuing each original or reissue patent, except a design or plant patent:	
By a small entity (§ 1.9(f))	$280.00
By other than a small entity	560.00
(b) Issue fee for issuing a design patent:	
By a small entity (§ 1.9(f))	100.00
By other than a small entity	200.00
(c) Issue fee for issuing a plant patent:	
By a small entity (§ 1.9(f))	140.00
By other than a small entity	280.00

(35 U.S.C. 6, 41, Pub. L. 97–247)

5. Section 1.19 is amended by revising paragraphs (a)–(c), (e) and (f), and by adding new paragraphs (a)(7) and (h) through (j) to read as follows:

§ 1.19 Document supply fees.

The Patent and Trademark Office will supply copies of the following documents upon payment of the fees indicated:

(a) Uncertified copies of Office documents:	
(1) Printed copy of a patent, including a design patent, statutory invention registration, or defensive publication document, except color plant patent or color statutory invention registration	$1.50
(2) Printed copy of a plant patent or statutory invention registration in color	6.00
(3) Copy of patent application as filed	9.00
(4) Copy of patent file wrapper and contents, per 200 pages or a fraction thereof	75.00
(5) Copy of Office records, except as otherwise provided in this section, per page	.50
(6) Microfiche copy of microfiche, per microfiche	.50
(7) Copy of patent assignment record	1.50
(b) Certified copies of Office documents:	
(1) For certifying Office records, per certificate	3.00
(2) For a search of assignment records, abstract of title and certification, per patent	12.00
(c) Subscription services:	
(1) Subscription orders for printed copies of patents as issued, annual service charge for entry of order and ten subclasses	7.00
(2) For annual subscription to each additional subclass in addition to the ten covered by the fee under paragraph (c)(1) of this section, per subclass	.70
* * * * *	
(e) List of patents in subclass.	
(1) For list of all United States patents and statutory invention registrations in a subclass, per 100 numbers or fraction thereof	1.00
(2) For list of United States patents and statutory invention registrations in a subclass limited by date or number, per 50 numbers or fraction thereof	1.00
(f) Microfiche copy of patent file record	6.00
* * * * *	
(h) Uncertified copy of a non-United States patent document, per document	10.00
(i) To compare and certify copies made from Patent and Trademark Office records but not prepared by the Patent and Trademark Office, per copy of document	5.00
(j) Additional filing receipts:	
Duplicate	14.00
Corrected due to applicant error	14.00

(35 U.S.C. 6, 41, 157)

6. Section 1.20 is amended by revising paragraphs (a)–(l) to read as follows:

§ 1.20 Post-issuance fees.

(a) For providing a certificate of correction of applicant's mistake (§ 1.323)	$29.00
(b) Petition for correction of inventorship in patent (§ 1.324)	140.00
(c) For filing a request for reexamination (§ 1.510(a))	1,770.00
(d) For filing each statutory disclaimer (§ 1.321):	
By a small entity (§ 1.9(f))	28.00
By other than a small entity	56.00
(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant	225.00
(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant	445.00
(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after December 12, 1980 and before August 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant	670.00
(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after August 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:	
By a small entity (§ 1.9(f))	225.00
By other than a small entity	450.00
(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after August 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:	
By a small entity (§ 1.9(f))	445.00
By other than a small entity	890.00
(j) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after August 27, 1982, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:	
By a small entity (§ 1.9(f))	670.00
By other than a small entity	1,340.00
(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after December 12, 1980 and before August 27, 1982	110.00
(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after August 27, 1982:	
By a small entity (§ 1.9(f))	55.00
By other than a small entity	110.00
* * * * *	

(35 U.S.C. 6, 41, 302; Public Laws 96–517, 97–247, 98–622)

7. Section 1.21 is amended by revising paragraphs (a) through (i), and (k), and adding a new paragraph (m) to read as follows:

§ 1.21 Miscellaneous fees and charges.

The Patent and Trademark Office has established the following fees for the services indicated:

(a) Registration of attorneys and agents:	
(1) For admission to examination for registration to practice, fee payable upon application	$250.00
(2) On registration to practice	81.00
(3) For reinstatement to practice	9.00
(4) For certificate of good standing as an attorney or—	
agent	10.00
Suitable for framing	86.00
(5) For review of a decision of the Director of Enrollment and Discipline under § 10.2(c)	92.00
(6) For requesting regrading of an examination under § 10.7(c)	92.00
(b) Deposit accounts:	
(1) For establishing or reinstating a deposit account	8.00
(2) Service charge for each month when the balance at the end of the month is below $1,000	20.00
(3) Service charge for each month when the balance at the end of the month is below $300 for restricted subscription deposit accounts used exclusively for subscription order of patent copies as issued	20.00
(c) Disclosure document: For filing a disclosure document	6.00
(d) Delivery box: Local delivery box rental, per annum	43.00
(e) International-type search reports: For preparing an international-type search report of an international type search made at the time of the first action on the merits in a national patent application	28.00
(f) Search of Office records: For searching Patent and Trademark Office records for purposes not otherwise specified, per one-half hour or fraction thereof	14.00
(g) CopiShare card: Cost per copy	0.20
(h) Recording of documents:	
(1) For recording each assignment, agreement or other paper relating to the property in a patent or application	7.00
(2) Where a document to be recorded under paragraph (h)(1) of this section refers to more than one patent or application , for each additional patent or application	2.00
(i) Publication in *Official Gazette:* For publication in the *Official Gazette* of a notice of the availability of an application or a patent for licensing or sale, each application or patent	7.00
* * * * *	
(k) For items and services, that the Commissioner finds may be supplied, for which fees are not specified by statute or by this part, such charges as may be determined by the Commissioner with respect to each such item or service.. [1]	
* * * * *	
(m) For processing each check returned "unpaid" by a bank	20.00

[1] Actual cost.

(35 U.S.C. 6, 41)

8. Section 1.24 is proposed to be revised to read as follows:

§ 1.24 Coupons.

Coupons in denominations of one dollar for the purchase of trademark registrations and one dollar and fifty cents for the purchase of patents, designs, defensive publications, and statutory invention registrations are sold by the Patent and Trademark Office for the convenience of the general public; these coupons may not be used for any other purpose. The one dollar coupons are sold individually and in books of 50 with stubs for record for $50 and the one dollar and fifty cent coupons are sold individually and in books of 50 with stubs for record for $75. These coupons are good until used; they may be transferred but cannot be redeemed.

(35 U.S.C. 6)

9. Section 1.25, paragraph (a), is revised to read as follows:

§ 1.25 Deposit accounts.

(a) For the convenience of attorneys, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§ 1.21(b)(1)). A minimum deposit of $1,000 is required for paying any fees due or in ordering any services offered by the Office. However, a minimum deposit of $300 may be paid to establish a restricted subscription deposit account used exclusively for subscription order of patent copies as issued. At the end of each month, a deposit account statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit. An amount sufficient to cover all fees, services, copies, etc., requested must always be on deposit. Charges to accounts with insufficient funds will not be accepted. A service charge (§ 1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $1,000. For restricted subscription deposit accounts, a service charge (§ 1.21(b)(3)) will be assessed for each month that the balance at the end of the month is below $300.

* * * * *

(35 U.S.C. 6)

10. Section 1.26 is amended by revising paragraph (c) to read as follows:

§1.26 Refunds.

* * * * *

(c) If the Commissioner decides not to institute a reexamination proceeding, a refund of $1,300 will be made to the requester of the proceeding. Reexamination requesters should indicate whether any refund should be made by check or by credit to a deposit account.

(35 U.S.C. 6, 41)

11. Section 1.53 is amended by revising paragraph (c) to read as follows:

§1.53 Serial number, filing date, and completion of application.

* * * * *

(c) If any application is filed without the specification or drawing required by paragraph (b) of this section, applicant will be so notified and given a time period with which to submit the omitted specification or drawing in order to obtain a filing date as of the date of filing of such submission. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less a $15.00 handling fee.

* * * * *

12. Section 1.297, paragraph (b), is revised to read as follows:

§1.297 Publication of statutory invention registration.

* * * * *

(b) Each statutory invention registration published will include a statement relating to the attributes of a statutory invention registration. The statement will read as follows:

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

(35 U.S.C. 6, 157)

13. Section 1.445 is amended by revising paragraph (a) to read as follows:

§ 1.445 International application filing and processing fees.

(a) The following fees and charges are established by the Patent and Trademark Office under the authority of 35 U.S.C. 376:	
(1) A transmittal fee (see U.S.C. 361(d) and PCT Rule 14)	$170.00
(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16) where:	
(i) No corresponding prior United States national application with fee has been filed	420.00
(ii) Corresponding prior United States national application with fee has been filed	250.00
(3) A supplemental search fee when required (see PCT Art. 17(3)(a) and PCT Rule 40.2), per additional invention	140.00
(4) The national fee, that is, the amount set forth as the filing fee under § 1.16 (a) through (d) credited, if requested at the time of filing, by an amount of $170.00 where an international search fee as required by paragraph (a)(2)(i) of this section has been paid on the corresponding international application to the United States Patent and Trademark Office as an International Searching Authority. Only one such credit is permitted based on a single international search fee.	
(5) Surcharge for filing the national fee or oath or declaration later than 20 months from the priority date:	
By a small entity (§ 1.9(f))	55.00
By other than a small entity	110.00
(6) For filing an English translation of an international application later than 20 months after the priority date (§ 1.61(b))	26.00

* * * * *

(35 U.S.C. 6, 376)

14. Section 1.446 is amended by removing paragraph (b):

§ 1.446 Refund of international application filing and processing fees.

* * * * *

(b) [Reserved]

(35 U.S.C. 6, 376)

Dated: July 31, 1985.

Donald J. Quigg,

Acting Commissioner of Patents and Trademarks.

[FR Doc. 85-18720 Filed 8-5-85; 8:45 am]

BILLING CODE 3510-16-M

PATENT NOTICES

Certificates of Correction for the Week of Aug. 20, 1985

Re. 31,898	4,473,103	4,497,039	4,507,653
D. 279,002	4,474,422	4,497,804	4,507,854
4,036,979	4,474,609	4,497,856	4,508,098
4,254,122	4,475,308	4,497,877	4,508,655
4,351,966	4,476,194	4,498,141	4,508,689
4,353,581	4,476,349	4,498,282	4,509,748
4,356,002	4,476,547	4,498,389	4,509,876
4,373,954	4,478,400	4,498,402	4,510,039
4,386,363	4,478,905	4,498,535	4,510,427
4,387,900	4,479,099	4,498,680	4,510,482
4,392,095	4,479,177	4,499,018	4,511,691
4,408,070	4,479,572	4,499,056	4,511,907
4,410,520	4,480,411	4,499,196	4,512,038
4,413,060	4,481,269	4,499,414	4,512,147
4,413,390	4,481,478	4,499,506	4,512,247
4,415,316	4,482,432	4,499,578	4,513,015
4,419,719	4,483,384	4,499,654	4,513,082
4,423,137	4,486,860	4,499,875	4,513,096
4,425,574	4,487,504	4,499,962	4,513,953
4,427,648	4,487,957	4,500,209	4,514,335
4,429,188	4,488,229	4,500,661	4,514,494
4,433,020	4,488,419	4,500,664	4,514,577
4,433,125	4,489,137	4,500,758	4,515,420
4,434,434	4,489,279	4,501,629	4,515,461
4,439,721	4,489,281	4,501,794	4,515,731
4,446,087	4,490,536	4,502,854	4,515,773
4,447,863	4,490,582	4,503,961	4,515,905
4,448,465	4,490,749	4,504,414	4,516,219
4,449,565	4,490,843	4,504,417	4,516,919
4,451,180	4,490,852	4,504,688	4,516,992
4,456,519	4,491,421	4,505,034	4,517,249
4,459,532	4,491,900	4,505,184	4,517,316
4,460,092	4,492,664	4,505,206	4,517,318
4,461,646	4,492,968	4,505,793	4,517,916
4,461,758	4,493,050	4,505,900	4,518,774
4,461,859	4,493,053	4,505,943	4,518,941
4,462,720	4,493,965	4,506,491	4,519,192
4,463,765	4,494,193	4,506,550	4,519,994
4,466,311	4,495,407	4,506,600	4,520,195
4,467,253	4,495,684	4,506,953	4,520,272
4,468,248	4,495,948	4,506,992	4,520,307
4,469,124	4,496,430	4,507,053	4,522,655
4,469,699	4,496,440	4,507,245	
4,469,767	4,496,508	4,507,399	
4,472,569	4,496,536	4,507,488	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 20, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	11-30-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-11-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	7-16-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-11-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-19-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-11-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-15-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during July 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,390,405 to 3,395,405, inclusive

Plant Patents ..... Numbers 2,817 to 2,824 inclusive

REISSUES

AUGUST 20, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,971

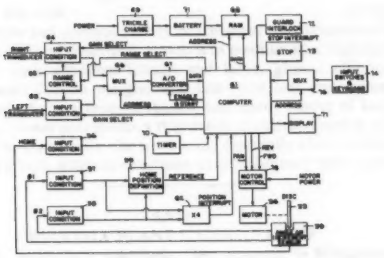
WHEEL UNBALANCE MEASUREMENT SYSTEM AND METHOD

Kenneth S. Gold, Canoga Park, Calif., assignor to FMC Corporation, Chicago, Ill.

Original No. 4,285,240, dated Aug. 25, 1981, Ser. No. 111,159, Jan. 11, 1980. Application for reissue Jan. 26, 1983, Ser. No. 464,094

Int. Cl.³ G01M *1/22*

U.S. Cl. 73—462 **45 Claims**



27. A method of calibrating apparatus for measuring unbalance in a body mounted on a spin shaft having an angular reference position relative to a supporting framework therefor and being coupled to a force transducer which provides an unbalance signal having an instantaneous magnitude indicative of a component of the unbalance force which results when the shaft is spun, comprising the steps of spinning the shaft with no load applied, digitizing the unbalance signal indicative of no load shaft unbalance, storing a plurality of digital sine and cosine representative quantities corresponding to predetermined angular increments of spin shaft rotation, modifying the digitized no load unbalance signal in accordance with the corresponding digital sine representative quantity at a plurality of the angular shaft increments while the shaft is being spun to obtain combined no load signals containing sine representative factors, modifying the digitized no load unbalance signal in accordance with the corresponding digital cosine representative quantity at a plurality of the angular shaft increments while the shaft is being spun to obtain combined no load signals containing cosine representative factors, summing the combined no load signals containing sine representative factors, summing the combined no load signals containing cosine representative factors, whereby shaft unbalance sums containing sine and cosine representative factors are obtained, and applying the shaft unbalance sums containing sine and cosine representative factors to the measured unbalance signals for the unbalanced body, thereby obtaining measured unbalance quantities corrected for shaft unbalance.

Re. 31,972

CASTING MOLD WITH CONSTRICTING DEVICE

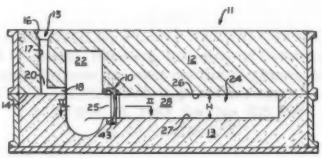
John R. Nieman, Pekin, and Roger A. Worman, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,831,662, dated Aug. 27, 1974, Ser. No. 317,522, Dec. 22, 1972. Application for reissue Oct. 6, 1980, Ser. No. 194,535

Int. Cl.³ B22C *9/08*

U.S. Cl. 164—362 **2 Claims**

1. In a mold assembly for casting having an upper portion and a lower portion and a casting cavity defined by said upper and lower portions in which a casting is to be formed, said upper and lower portions mating along an interface plane, said casting cavity communicating with a riser cavity in which a riser is formed for feeding molten material to the casting cavity as the casting solidifies, means for forming a stricture between the riser cavity and casting cavity and for regulating the flow of molten metal from the riser cavity into the casting cavity, said means including a constriction device *formed from a fired ceramic material and* having aperture means therein, *a thin wall of about one-eighth inch in thickness, and a thickened ribbed peripheral portion, said aperture means being an aperture defined*



by a rounded edge of the thin wall and of a size sufficient in inhibiting the flow of molten metal from the riser cavity into the casting cavity to maintain the level of molten metal within the riser cavity about said aperture means, said device being interposed between the casting cavity and the riser cavity at the point of communication thereof, and *said thickened ribbed peripheral portion of* said device simultaneously engaging both said upper and lower portion of said mold when said portions are in mating engagement along said interface plane.

Re. 31,973

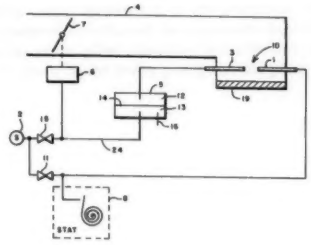
FLUIDIC FLOW SENSING AND CONTROL APPARATUS

Richard C. Mott, Harwood Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Original No. 4,182,486, dated Jan. 8, 1980, Ser. No. 770,471, Feb. 22, 1977. Continuation of Ser. No. 590,995, Jun. 27, 1975, abandoned. Application for reissue Apr. 22, 1983, Ser. No. 487,631

Int. Cl.³ G01F *1/00;* **F24F** *11/04*

U.S. Cl. 236—49 **25 Claims**



1. A variable volume system for controlling the position of a damper to regulate a condition of air in a duct, said system comprising:

air velocity sensor means comprising first nozzle means and second nozzle means for directly measuring the velocity of air moving past said first and second nozzle means, said first and second nozzle means adapted to be arranged for sensing said condition of said air in said duct by passing at least a portion of said air past said first and second nozzle means, said first nozzle means arranged to issue a jet of

fluid and said second nozzle means arranged for receiving a portion of said fluid dependent upon said condition of said air;

fluid supply terminal means;

first connecting means connecting said terminal means to said first nozzle means, *said first connecting means including condition responsive pressure control means for regulating the fluid supplied to said first nozzle means to control the velocity of said jet of fluid;*

damper actuator means adapted to control the position of said damper; and,

second connecting means connecting said second nozzle means to said damper actuator means for varying the position of said damper dependent upon said condition of said air and dependent upon the velocity of said jet of fluid.

PLANT PATENTS

GRANTED AUGUST 20, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,537
HYBRID CHESTNUT TREE 'REVIVAL'

Robert D. Wallace, Rte. 3, Box 267, Alachua, Fla. 32615

Filed Nov. 4, 1983, Ser. No. 548,761
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of Chestnut tree, substantially as illustrated and described, which is of medium size, vigorous, upright, with abundant foliage and large, glossy, elliptical leaves with dentate margins and late (post leaf appearance) flowering; the tree being a regular and heavy bearer of large and very sweet nuts in burrs that crack in mid-September and release the crop easily; the trees being especially characterized by a very high inherent resistance to the chestnut bark blight.

5,538
BEGONIA PLANT NAMED TANGO

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Nov. 1, 1983, Ser. No. 547,722
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant named Tango, as described and illustrated, and particularly characterized by its relatively large, full semiball shaped double flowers with ruffled edges; uniform deep peach-pink flower color; slow and compact growth habit; firm foliage; excellent propagation by leaf or stem cuttings, and by its excellent keeping qualities.

5,539
BEGONIA PLANT NAMED IMKE

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Nov. 1, 1983, Ser. No. 547,723
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant named Imke, as described and illustrated, and particularly characterized by its medium pink flower color; double flower form, tending to nearly single in periods of low light; compact and vigorous growth habit, and floriferousness.

5,540
AFRICAN VIOLET PLANT NAMED CAPRICORN

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gesellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Sep. 23, 1983, Ser. No. 535,388
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Capricorn, as illustrated and described, and particularly characterized by its deep purple-red slightly waved single flowers, variegated leaves having a bright green leaf center, with the leaves being wavy and funnel shaped, and serrated at the edges; very floriferous flowering habit, with 7–9 upright and rigid flower stems being formed, each carrying up to 13 or more single flowers, and by its compact and full flower bouquet positioned centrally above the leaves.

5,541
VARIEGATED SCHEFFLERA PLANT 'JOSEF RESCH'

Josef Resch, 5699 State Rd. 775, Venice, Fla. 33595

Filed Jan. 10, 1983, Ser. No. 456,980
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Schefflera plant of the species *Brassaia actinophylla* substantially as herein shown and described, characterized particularly as to novelty by the overall variegation of leaves, stems, and trunk from mimosa to green, close noded position of stems and upright rapid growth with leaves of leathery semi-gloss appearance on the top side and leathery matte appearance on the underside, and with a preponderance of leaf stems at the top portion and the intermediary portion of the plant extending umbrella-like with leaves hanging on towards the lower portion of the plant.

PATENTS

GRANTED AUG. 20, 1985

ERRATA

For CLASS	See PATENT NO.
623–002	4,535,483
623–002	4,535,484
623–016	4,535,485
623–022	4,535,486
623–022	4,535,487
623–006	4,535,488
604–051	4,535,773
114–103	4,535,825
290–040	4,536,126
446–102	4,536,162
514–007	4,536,395
514–002	4,536,396
514–011	4,536,397
514–043	4,536,398
514–063	4,536,399
514–120	4,536,400
514–173	4,536,401
514–443	4,536,402
514–483	4,536,403
514–627	4,536,404
514–781	4,536,405

PATENTS

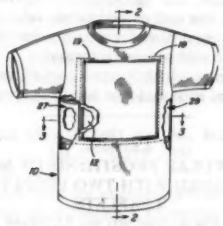
GRANTED AUGUST 20, 1985

GENERAL AND MECHANICAL

4,535,477
DRY SUIT
Franklyn K. Musto; Hugh E. Bourn; John Buchanan, and Duncan A. Kay, all of Essex, England, assignors to Musto & Hyde Accessories Ltd., Essex, England
Filed Mar. 28, 1984, Ser. No. 594,319
Claims priority, application United Kingdom, Mar. 29, 1983, 8308636
Int. Cl.[3] B63C *11/04*
U.S. Cl. 2—2.1 R **5 Claims**

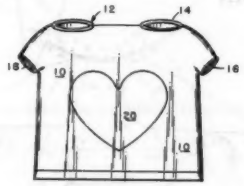
1. A two-piece dry suit comprising top and bottom suit pieces having respective sealing bands for producing a rolled seal between said suit pieces at the waist of the suit, and a part securely fastened to one of said pieces at a position to one side of the rolled seal, said part being adapted to overlie and extend around said rolled seal so as to terminate between said rolled seal and the other of said pieces, and including means to hold said part in firm engagement with said other piece, whereby said part retains the seal securely in the rolled condition without any additional securing device being applied to the suit.

4,535,478
BODY ARMOR
Tim T. Zäfle, 230 Lafayette St., Gretna, La. 70053
Filed May 20, 1983, Ser. No. 496,618
Int. Cl.[3] F41H *1/02*
U.S. Cl. 2—2.5 **9 Claims**



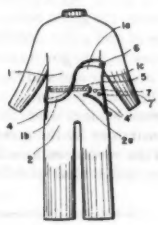
1. An article of body armor comprising a standard-style undergarment such as a T-shirt having front and rear panels defining a neck opening, a first piece of material seamed along bottom and side edges thereof to an inner surface of the front panel so as to provide a first open-topped pocket in the front of the undergarment covering a substantial area of the front panel, a second piece of material seamed along bottom and side edges thereof to an inner surface of the rear panel so as to provide a second open-topped pocket in the rear of the undergarment covering a substantial area of the rear panel, and first and second armor insert panels of soft armor construction comprising plural layers of flexible sheet material for selective receipt in and removal from the respective pockets through the open tops thereof.

4,535,479
TWO PERSON GARMENT
M. Fatima M. Paula, P.O. Box 224, Dorchester, Mass. 02122
Filed Oct. 29, 1984, Ser. No. 665,613
Int. Cl.[3] A41B *1/12*
U.S. Cl. 2—69.5 **5 Claims**



1. A single garment for covering the upper bodies of two persons comprising a fabric body covering said two persons in a single wrap in the manner of a T-shirt, sweatshirt, beach cover, robe or jacket, means forming two neck openings spaced far enough from each other to fit two persons comfortably, means forming one left arm opening, and means forming one right arm opening respectively at each side of the body.

4,535,480
ONE-PIECE GARMENT
Hirohiko Kunieda, Ogaki, Japan, assignor to Hinomaru Seni Co., Ltd., Ogaki, Japan
Filed Jan. 5, 1984, Ser. No. 567,983
Claims priority, application Japan, Oct. 4, 1983, 58-154609
Int. Cl.[3] A41D *1/06*
U.S. Cl. 2—079 **5 Claims**



1. A one-piece garment comprising:
an opening formed in a portion of the back near the small of the back,
a seat flap provided at the side of said opening adjacent to the lower half of said back, said seat flap having an upper edge extending to a portion near said small of the back and both lateral side edges openably connected to the front, said seat flap being provided at its upper end portion with a horizontally stretchable rubber belt;
a hanging flap extending from the top of said opening adjacent to the upper half of the back and having a point of separation from said front positioned above the upper edge of said seat flap, said hanging flap having an enlarged lower end extending beyond both side edges of said seat flap to lap said seat flap; and

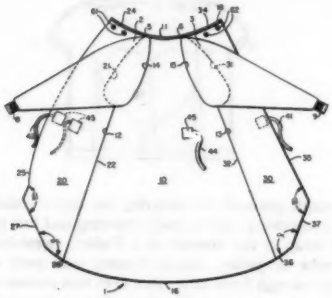
a first set of fasteners attached to the enlarged lower end of said hanging flap, and a second set of fasteners which mate with the first set of fasteners, said second set of fasteners being attached to both sides of the front of the garment at locations corresponding to said enlarged lower end of said hanging flap.

4,535,481

SURGICAL GOWN FOR HIGH FLUID PROCEDURES

Dawn Ruth-Larson, Norcross, Ga., and James S. Nels, Montclair, N.J., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 12, 1984, Ser. No. 630,475
Int. Cl.³ A41B 9/00
U.S. Cl. 2—114 **12 Claims**



1. A back-opening gown of nonwoven material comprising:
a pair of sleeves;
a front panel joined at its upper lateral edges to said sleeves, said front panel flaring pronouncedly below said sleeves;
a pair of side panels attached to said sleeves and to the lateral edges of said front panel below said sleeves, each of said side panels having a lower opposed corner section, the edge of said corner section forming an obtuse angle with respect to the bottom edge of said front panel in the range of about 125 to about 145 degrees; and
back closure means, the gown being constructed so that the upper portion of said gown conforms substantially to the torso of the wearer, said gown extending from the neck to the ankles of a wearer and said flaring front panel providing girth to the lower portion of said gown to permit the wearer to spread his legs while in a seated position without being constrained by the gown material, and the angled edges of the corner sections causing the edges of the sections to be located clear of a floor while the wearer is seated.

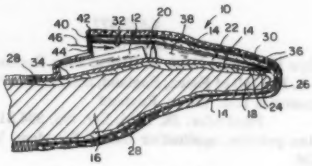
4,535,482

HEATED GLOVE

George Spector, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and Lesley Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 24, 1983, Ser. No. 460,750
Int. Cl.³ A41D 19/00
U.S. Cl. 2—160 **5 Claims**

1. A heated glove for utilizing a hand warmer which comprises:
(a) an inner layer of insulated material placed around a hand and fingers, the inner layer forming a sealable top pocket to hold the hand warmer and five ducts, each duct extending from the top pocket over each finger and having a plurality of holes above each finger tip;
(b) a middle layer of waterproof material placed around the inner layer;
(c) an outer layer of leather material placed around the middle layer to form the heated glove; and



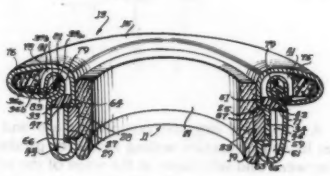
(d) means for allowing heat to travel from the hand warmer to top of each finger tip of the hand in the heated glove.

4,535,483

SUTURE RINGS FOR HEART VALVES

Jerome J. Klawitter, Austin, Tex., and Harry W. Cromie, Pittsburgh, Pa., assignors to Hemex, Inc., Austin, Tex.

Filed Jan. 17, 1983, Ser. No. 458,618
Int. Cl.³ A61F 1/22
U.S. Cl. 623—2 **20 Claims**



2. A suture ring for a heart valve having a valve body providing a blood flow passageway, occluder means mounted within said valve body for opening and closing the passageway and a protrusion around the valve body having first and second end surfaces, the suture ring comprising
a retainer ring having an interior surface proportioned to surround said protrusion, inwardly extending means for engaging said first end surface of the protrusion and a deformable end portion for engaging the second end surface to lock said retainer ring onto the protrusion,
a fabric tube,
band means for securing the ends of said fabric tube to said retainer ring so that exposed surfaces of said retainer ring when it is locked onto said protrusion are fully covered by said fabric tube, said band means comprising a first band for securing one end of said fabric tube to said retainer ring and a second band for securing the other end of said fabric tube to said retianer ring, and
deformable means which forms a part of said retainer ring for holding at least said first band in permanent position.

4,535,484

CARDIAC VALVULAR PROSTHESIS OF MECHANICAL TYPE PROVIDED WITH TWO FREELY MOVING LEAFLETS

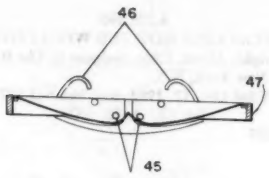
Walter Marconi, Via A. Barilatti no. 72, 00144 Roma, Italy

Filed Mar. 5, 1982, Ser. No. 355,129
Claims priority, application Italy, Mar. 17, 1981, 48040 A/81; Dec. 11, 1981, 49893 A/81
Int. Cl.³ A61F 1/22
U.S. Cl. 623—2 **10 Claims**

1. A mechanical cardiac valve prosthesis comprising:
(a) a housing ring forming a flow orifice;
(b) a sewing ring on the external surface of said housing ring;
(c) a pair of leaflets with edges free of projections placed in said housing, each leaflet guided by a rotation fulcrum structure and by a constraint structure on said housing

ring so that it moves freely from an opened to a closed position;

(d) said housing ring having on its internal surface curved



grooves that engage the edges of each of said leaflets and imparts mixed rotation and translational movement to said leaflets as they move from said open to said closed position.

4,535,485

POLYMERIC ACRYLIC PROTHESIS

Arthur Ashman, New York, N.Y., and Paul F. Bruins, Austin, Tex., assignors to Medical Biological Sciences, Inc., New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,739
Int. Cl.³ A61F *1/00, 5/04*
U.S. Cl. 623—16 **30 Claims**

1. A packing material for forming in vivo prosthetic implants for hard tissue, the packing material comprising disjoint micron sized particles, each particle having an inner core comprised of a first biologically-compatible polymeric material and having an outer coating generally surrounding the inner core, the outer coating being comprised of a second biologically-compatible polymeric material, the second polymeric material being hydrophilic and having a composition different from the composition of the first polymeric material, each particle incorporating a sufficient quantity of barium sulfate to render a prosthetic implant formed of a compacted mass of the particles visible in an X-ray radiograph, the particles being of a size to permit a mass of the disjoint particles to be packed in a body cavity having at least one surface comprised of a hard tissue to form a prosthetic implant for the hard tissue with interstices between compacted particles of the prosthetic implant forming pores into which tissue can grow.

4,535,486

LOW FRICTION BEARING SURFACES AND STRUCTURES PARTICULARLY FOR ARTIFICIAL PROSTHETIC JOINTS

Jack Roberts, Farmington Hills, Mich., and Robert L. Johnson, Edina, Minn., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed May 18, 1981, Ser. No. 264,950
Int. Cl.³ A61F *1/04*
U.S. Cl. 623—22 **3 Claims**

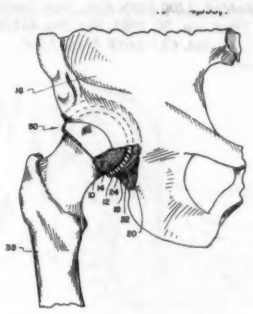
1. A prosthetic joint for engaging a bone head in a body socket, the bone head having a trabecular structure and a modulus of elasticity, comprising:

a cup adapted to be secured in the body socket; and

a shell having a matrix of cured epoxy resin adapted to be secured over the bone head and slidably engaged in said cup;

said shell having a composite coating in sliding engagement with said cup which is made of from 2 to 30 parts by weight epoxy, from 1 to 5 parts by weight Al_2O_3 and from 1 to 10 parts by weight metallic substance chosen from the group consisting of Cu and stainless steel;

said epoxy matrix including reinforcing glass fibers embedded therein and oriented with the trabecular structure of the bone head, said glass fibers being provided in an amount to



cause said matrix to mimic the modulus of elasticity of the bone head.

4,535,487

ENDOPROSTHESIS SHAFT

Friedrich J. Esper, Leonberg, and Walter Gohl, Aidlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 13, 1984, Ser. No. 570,663
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1983, 3301415
Int. Cl.³ A61F *1/00*
U.S. Cl. 623—22 **12 Claims**

1. Endoprosthesis shaft for a hip joint having tension-release effect, said shaft having front, back, medial and lateral surfaces and being tapered for fitting into a bore in the top of a femur, said shaft having an oblique collar for fitting over the resected surface of the femur; and

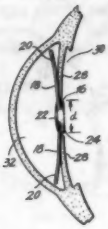
said lateral surface including tension force resisting means along a portion of the length thereof, said medial surface including compression force resisting means along the length thereof, said front and back surfaces including load-bearing means along the length thereof, said front and back surfaces further including a plurality of transversely formed, longitudinally spaced apart cavities located solely in the upper portion of said shaft adjacent said collar, each of said cavities being separated by transverse ribs, wherein said ribs and cavities are continuous about the juncture of said front, back and lateral surfaces and terminate in spaced apart relation on said lateral surface, said lateral surface having a continuous, longitudinally extending rib separating said ribs and cavities and terminating in the region of said tension resisting force means whereby said cavities accept tissue ingrowth thereby relieving tensional forces tending to shift said shaft relative to the bone.

4,535,488

ANTERIOR-POSTERIOR CHAMBER INTRAOCULAR LENS

Heskel M. Haddad, 1200 Fifth Ave., New York, N.Y. 10029

Filed Sep. 30, 1982, Ser. No. 431,490
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 623—6 **6 Claims**



1. An intraocular lens implant device for an eye having anterior and posterior chambers and an iris partially separating said chambers, said iris having a pupil opening therethrough, comprising:

a lens dimensioned to fit within said pupil opening; and

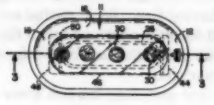
two support legs each attached at one end to said lens and extending laterally from said lens, said support legs being adapted to engage the tissues of said eye entirely in said anterior chamber and being adapted to hold said lens without use of sutures or pegs in a position within said eye at which said lens is aligned with said pupil opening and extends through said pupil opening in part into said posterior chamber, at least one leg being adapted to make contact with a surface of the iris in the anterior chamber, said at least one leg being cambered in transverse cross-section, said camber being adapted to reduce the area of contact between the iris surface and said at least one leg, whereby said lens implant device may be implanted through a small corneal incision.

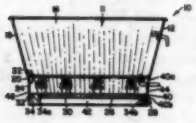
4,535,489

DECORATIVE BATHTUB

Carol M. Elkins, 4728 Elliot Ave., S., Minneapolis, Minn. 55407

Filed Dec. 8, 1983, Ser. No. 559,388
Int. Cl.³ A61H *3/02*
U.S. Cl. 4—546 **9 Claims**





1. An elevated bathtub comprising:

(a) a tub having front, rear, and side walls, and a transparent bottom wall having a top and bottom surface, the transparent bottom wall being positioned such that the bottom wall can be illuminated from below;

(b) means for illuminating the transparent bottom wall from below; and

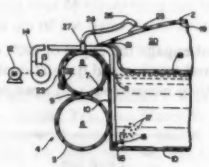
(c) means for gaining access to the area beneath the transparent bottom wall so as to permit placement, removal and rearrangement of any articles contained therein.

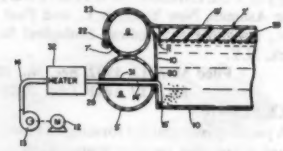
4,535,490

INFLATABLE HOT TUB WITH COVER

Robert B. Wright, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,847
Int. Cl.³ A47K *3/06*
U.S. Cl. 4—585 **15 Claims**





1. An inflatable hot tub, comprising:

an endless inflatable tube composed of flexible sheet material and having inflation coupling means for introducing pressurized gas to its interior for inflating the same, said tube extending in a closed horizontal loop;

a liquid impervious sheet material bottom extending horizontally and generally coextensive with the interior area of said tube loop;

means joining said bottom around its entire periphery to said tube in a liquid impervious manner to form therewith an open top tub for containing liquid;

a sheet material cover generally coextensive with the open top area of said tub, and including means for securing said cover in a manually releasable manner around the entire top periphery of said tube and heat insulating means secured to said sheet cover within the open top area of said tub;

a rigid pipe extending around generally the entire periphery of the inside of said hot tub adjacent said bottom, and having a plurality of nozzle means spaced along its length for ejecting a stream of gas bubbles into said hot tub when pressurized; and means supplying pressurized air to said tube.

4,535,491

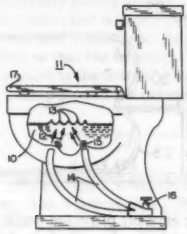
COMMODE ANTI-SPLASH DEVICE AND METHOD

Scott C. Young, 203-B Wilson St., Greensboro, N.C. 27401

Filed Apr. 20, 1984, Ser. No. 602,528
Int. Cl.³ E03D *9/08*
U.S. Cl. 4—658 **5 Claims**

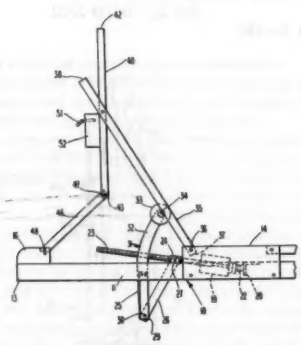
1. An anti-splash device for use with a commode having a bowl and a quantity of water for receiving human waste, said water and waste remaining in the bowl until flushed, the anti-splash device comprising: agitating means, said agitating means including a supply nozzle for directing a stream of liquid through the bowl water, said agitating means positioned proxi-

mate said bowl for agitating said bowl water to maintain it in a turbulent state to prevent splash and to reduce the noise of



the waste contacting the water while the water is contained in the bowl prior to flushing.

4,535,492
PILLOW BED MECHANISM
Albert E. Sebest, Lancaster, Pa., assignor to Spectro Industries, Inc., Jenkintown, Pa.
Filed Dec. 16, 1982, Ser. No. 450,264
Int. Cl.³ A61G 7/00
U.S. Cl. 5—68 **4 Claims**



1. An improved body supporting assembly wherein a horizontal frame member has a back-support section pivotally connected to head-rest section with a drive means for providing a force for raising and lowering said back-support section and said head-rest section from horizontal positions to angularly inclined positions relative to said frame, the improvement comprising linking said head-rest section to said back-support section at a predetermined point and deflecting said drive means to allow independent inclined movement of said head-rest section relative to the horizontal position of said back-support section.

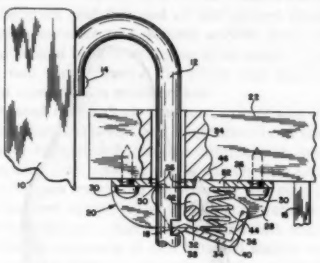
4,535,493
CRIB DROP SIDE LATCH
Edmond P. Guillot, Putnam, Conn., assignor to Gem Industries, Inc., Gardner, Mass.
Filed Apr. 27, 1984, Ser. No. 604,731
Int. Cl.³ A47D 7/02
U.S. Cl. 5—100 **9 Claims**

1. A crib having a drop side, a drop rod for the drop side, a notch in the rod, a double acting latch therefor,

said latch comprising a first part fixed with relation to the drop side,

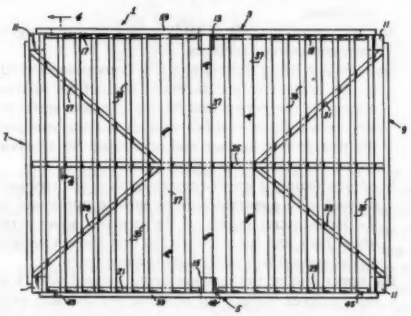
a second part secured to but movable on the first part, a projection on the second part for selective engagement in the drop rod notch,

means holding the second part with the projection in the notch so that the drop side is fixed vertically on the drop rod,



said first part being movable upwardly with the drop side releasing said means so that the second part may be moved to release the projection from the notch and the drop side lowered said means including a second projection bearing on a portion of the drop side and held immobile thereby until the drop side is moved upwardly.

4,535,494
SLAT TYPE MATTRESS FOUNDATION
Arthur Diamonstein, Norfolk, Va., assignor to Paramount Industrial Companies, Inc., Norfolk, Va.
Filed Jan. 6, 1984, Ser. No. 568,612
Int. Cl.³ A47C 23/06
U.S. Cl. 5—400 **7 Claims**



1. A mattress foundation comprising:

(a) A rectangular frame defined by a pair of longitudinal side assemblies, a pair of transverse end assemblies, and a longitudinal center board having its opposite ends secured to the end assemblies;

(b) a support surface defined substantially by a plurality of primary and secondary slats extending transverely across the frame and spaced longitudinally therealong;

(c) each primary slat being of a first width and each secondary slat being of a second width, with the first width being narrower than the second width;

(d) the secondary slats being confined to substantially the longitudinal one-third portion of the frame; and

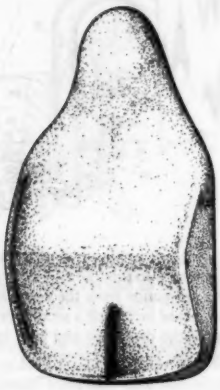
(e) a pair of braces extending from the corresponding corners of each end assembly and converging to the center board at two points substantially adjacent the opposite sides of the longitudinal central one-third portion of the frame.

4,535,495

BACK REST CUSHION

Peter M. Oldfield, Sausalito, Calif., assignor to Easy Ride, Inc., San Mateo, Calif.

Filed Jul. 25, 1983, Ser. No. 517,076
Int. Cl.³ A47C 7/02
U.S. Cl. 5—432 **6 Claims**



1. A therapeutic back support comprising:

a unitary cushion of resilient material, having a forward back engaging side,

said cushion having a lower end adapted to rest on a support surface for a seated person and having an upper end extending above the thoracic vertebrae,

said cushion having a width about equal to the width of a human back and being symmetrical about a vertical central plane,

the back engaging side of said cushion having merging concave and convex surfaces,

said cushion being formed to a first convex surface adjacent to the lower end and centrally thereof for abutting the coccyx of the person and having concave surfaces laterally outwardly of said first convex surface, merging with the first convex surface and positioned for receiving the upper buttocks of the seated person,

at approximately a lower-central location the cushion being formed with a second convex surface positioned to abut the lumbosacral region of the person's spine across the lower back and spaced from the first convex surface with a concave surface interposed therebetween,

the upper end of the cushion being formed with a central third convex surface for abutting the thoracic region of the person's spine and spaced above the second convex portion by a merging concave surface, and

the cushion being cut away to left and right of the central third convex surface to provide open space to freely accommodate movement of the upper torso, arms and shoulder blades of the seated person.

4,535,496

WATER BED BAR

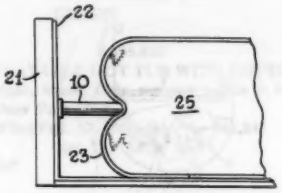
Dennis D. Parker, 6435 SE. Clatsop, Portland, Oreg. 97206

Filed Nov. 8, 1983, Ser. No. 549,717
Int. Cl.³ A47C 27/08
U.S. Cl. 5—451 **10 Claims**

1. An apparatus in combination with a water bed comprising; a bed frame; a bed liner, a bedsheet, and a water bladder having a filling closure whereby the apparatus is employed to facilitate the insertion of the bedsheet between the water bladder and the bed liner, and wherein the apparatus comprises;

an elongated cylindrical unit,

a contact surface element provided on one end of the cylindrical unit, and adapted to contact the bedsheet, and



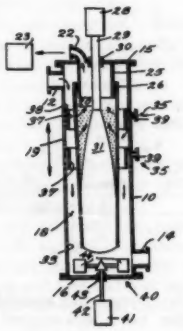
a support surface element provided on the other end of the elongated cylindrical unit, and adapted to contact the bed liner inside the bed frame, to maintain the said contact surface in contact with the bed sheet.

4,535,497

METHOD FOR TREATMENT OF SUSPENSIONS IN MOVEMENT

Finn Jacobsen, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Division of Ser. No. 223,741, Jan. 9, 1981, Pat. No. 4,368,628. This application Aug. 18, 1982, Ser. No. 409,031
Claims priority, application Sweden, Jan. 10, 1980, 8000196; Jan. 10, 1980, 8000198
Int. Cl.³ D21D 5/02
U.S. Cl. 8—156 **4 Claims**



1. A method of treating a suspension flowing through a container in a first direction, the container elongated in a dimension coextensive with said first direction and having mounted therein a screen body reciprocal in the dimension of elongation of the container both in the first direction and in a second direction opposite the first direction, the screen body having a perforated screen surface defining a screen cavity volume therewithin, said method comprising the steps of:

(a) introducing suspension under a motive force into the container inlet and withdrawing it from the container outlet so that it flows in the first direction within the container;

(b) effecting movement of the screen body in the first and second directions within the container to extract some of the liquid from the moving suspension within the container so that it flows into the screen cavity volume;

(c) withdrawing the liquid passing into the screen cavity volume from that volume to an area remote from the container; and

(d) introducing treatment liquid into the container, from an interior sidewall of the container, so that during liquid extraction with the screen body a crosswise flow of treat-

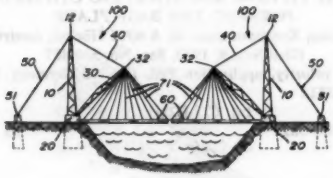
ment liquid is obtained through substantially all suspension flowing through the container; and wherein at the points of treatment liquid introduction a baffle plate is provided directing the treatment liquid in the first direction, and substantially evenly around the entire circumference of the container, and wherein step (d) is practiced by introduced treatment liquid into the container adjacent each baffle plate so that the treatment liquid initially has a velocity component in the first direction and is introduced substantially evenly around the circumference of the container.

4,535,498

SUSPENSION BRIDGE

David R. Webster, 320 Victoria Ave., Westmount, Quebec, Canada H3Z 2M8

Filed Apr. 14, 1983, Ser. No. 485,041
Int. Cl.³ E01D *11/00*
U.S. Cl. 14—18 **23 Claims**



1. A bridge structure comprising in combination:

(a) a first elongated compression member having one end thereof supported upon a first base and the other free end thereof disposed upwardly of said first base;

(b) a first elongated boom-like compression member supported upon one end thereof, said first elongated boom-like compression member being disposed angularly relative to said first elongated compression member whereby the free ends of said first elongated compression member and said first elongated boom-like compression member are spaced one from another in a first vertical plane;

(c) a first tension tie means having a fixed length extending between said free ends of said first elongated compression member and said first elongated boom-like compression member, whereby to connectedly support said first elongated boom-like compression member off said first elongated compression member, a second tension tie means having a fixed length extending between said free end of said first elongated compression member and a first anchor point spaced from said first base whereby an acute angle is formed between said second tension tie means and said first elongated compression member;

(d) a second elongated compression member, being similar to said first elongated compression member, said second elongated compression member having one end thereof supported upon a second base and the other free end thereof disposed upwardly of said second base in similar manner to said first elongated compression member, said first and second bases being positioned in selected spaced relation one to another;

(e) a second elongated boom-like compression member supported upon one end thereof, said second elongated boom-like compression member being similarly angularly disposed, as said first elongated boom-like compression member, relative to said second elongated compression member whereby the free ends of said second elongated compression member and said second elongated boom-like compression member are spaced one from another in a second vertical plane substantially parallel spaced from said first vertical plane;

(f) a third tension tie means having a fixed length, similar to said first tension tie means, said third tension tie means extending between said free ends of said second elongated compression member and said second elongated boom-like compression member, whereby to connectedly support said second elongated boom-like compression member off said second elongated compression member, fourth tension tie means having a fixed length, similar to said second tension tie means, said fourth tension means extending between said free end of said second elongated compression member to a second anchor point spaced from said second base whereby an acute angle is formed between said fourth tension tie means and said second elongated compression member; and

(g) an elongated traffic deck structure, comprising a rigid deck truss, disposed below and longitudinally of said first and second elongated boom-like compression members and supported from above via respectively fifth and sixth tension tie means connected between the free ends of said first and second elongated boom-like compression members and said deck structure, said fifth and sixth tension tie means lying respectively in said first and second vertical planes and comprising a plurality of elongated tension members depending in fan-like configuration toward said deck structure.

4,535,499

SHOE POLISHING DEVICE AND SERVO-APPLICATOR MEANS FOR USE THEREIN

Chun S. Cho, 554 Winslow Way East, Winslow, Wash. 98110

Filed Feb. 23, 1984, Ser. No. 583,010
Int. Cl.³ A47L *23/06*
U.S. Cl. 15—24 **20 Claims**

1. A shoe polishing device comprising a support having a rotor rotatably mounted thereon which is adapted so that an applicator wheel with a cylindrical outline can be mounted on the same for the transfer of polishing compound to the shoe at the outline of the wheel, servo-applicator means for applying a polishing compound to the outline of the wheel for transfer to the shoe, including pushbutton-like carrier means which are mounted on the support to reciprocate along a parallel to a line intersecting the outline of the wheel, and holder means which are mounted on the carrier means to reciprocate in relation to the carrier means along the line, and adapted to support an elongated stick-like body of polishing compound thereon, the body of compound being supported on the holder means so that it projects along the line with the tip thereof oriented toward the outline of the wheel, and there being means operable to position the holder means and thus the tip of the compound with respect to the carrier means along the line, yieldable biasing means which are operable to displace the carrier means in the direction relatively away from the outline of the wheel, and restrainer means which are operable to restrain the carrier means in a position on the support in which, when the holder means has assumed a predetermined position on the line, the body of compound will assume in turn an armed condition in which the tip of it is spaced apart from the outline of the wheel by a predetermined distance therebetween, the carrier means being displaceable the length of said distance in opposition to the bias thereon, to engage the tip of the com-

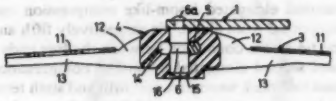
pound with the outline of the wheel for transfer of the compound thereto.

4,535,500

CONNECTING DEVICE FOR WIPER BLADES

José Verton, Saint-Vincent, and Alain Henrion, Saint-Mard, both of Belgium, assignors to Champion Spark Plug S.A., Diegem, Belgium

Filed Jun. 12, 1984, Ser. No. 619,885
Claims priority, application France, Jun. 27, 1983, 83 10575
Int. Cl.³ B60S *1/32, 1/40*
U.S. Cl. 15—250.23 **10 Claims**



1. A connecting device (4,5,6,19,5,6) for connecting a wiper blade (3,9) to a wiper arm (1), wherein the wiper blade (3,9) is capable of rotating about a first pivot pin (6) attached to the wiper arm (1) and about a second pivot pin (5) attached to the superstructure (3) of the wiper blade (3,9) and extending substantially perpendicularly with respect to the first pivot pin (6) characterized in that:

the body (4,19) of the device comprises a seat (15,25) for the first pivot pin (6) which has the form of a straight circular cylinder and a seat (14,24) for the second pivot pin (5) which has the form of a T or L-shaped straight cylinder; and

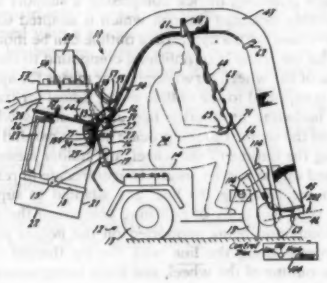
the first pivot pin (6) of the device includes an annular recess (16) capable of cooperating with the second pivot pin (5).

4,535,501

BATTERY POWERED VACUUM TRASH COLLECTOR

John R. Hollowell, 22179 Long Blvd., Dearborn, Mich. 48124, and John F. Hollowell, 6526 Sharon Dr., Garden City, Mich. 48135

Filed Jul. 19, 1983, Ser. No. 515,341
Int. Cl.³ A47L *9/00*
U.S. Cl. 15—339 **15 Claims**



1. A mobile vacuum trash collector comprising a bin, a lid mounted on said bin which acts as a plenum chamber, a vacuum blower disposed on said lid, a direct current motor having a predetermined finite no load speed limit coupled to said vacuum blower and operable to produce a steady state suction under load, means for connection to a storage battery power source for energizing said motor, a flexible hose having an inner end communicating with said plenum chamber and an outer end, means accessible to an operator for maneuvering said outer end, said outer end disposed substantially in a flat plane and arranged to permit the closing of said outer end against a surface thereby substantially diminishing the volume of air drawn into said plenum chamber causing said motor speed to approach said speed limit, and thereby developing a greater than steady state suction when said outer end is removed from against said surface;

said trash collector further comprising electrical circuit means having first and second nodes for coupling to a first source of electrical energy and having third and fourth nodes for coupling to a second source of electrical energy, and switching means coupled to said nodes and to said motor and operable between a series connected position in which said second node is coupled to said third node and a parallel connected position in which said first node is coupled to said third node and said second node is coupled to said fourth node, said series providing greater suction than said parallel position and said parallel position providing greater energy economy than said series position.

4,535,502

METHOD OF FABRICATING A BASE PLATE FOR A METAL FITTING, AND STAMPING UTILIZED IN FORMING THE BASE PLATE

Alfred Grass, Konsumstrasse 20, A-6973 Höchst, Austria

Filed Sep. 9, 1983, Ser. No. 530,857
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233512
Int. Cl.³ B21D *53/36*
U.S. Cl. 16—382 **11 Claims**

1. A method of fabricating a base plate adapted to receive a fitting of C-shaped cross-section, and having a longitudinal axis and generally U-shaped configuration with outwardly extending lower end mounting portions, a guide plate protion spaced from and generally parallel to the end mounting portions, leg portions perpendicular to and interconnecting the end mounting portions and the guide plate portion, said guide plate portion being wider than the legs transversely of the longitudinal axis to define therewith a T-shaped cross-section, said method comprising:

providing a metal stamping having a longitudinal axis, and bending opposite end portions of said stamping at two spaced lines extending at right angles to the longitudinal axis to define said legs, guide plate portion and end mounting portions.

4,535,503

DOOR GLASS HINGE HAVING A SPACER RING

Ryuhei Narita, Yokohama; Hiroyuki Aida, Hatano, and Yoshinori Kamiya, Zama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 386,647, Jun. 9, 1982, abandoned. This application Jun. 19, 1984, Ser. No. 621,887
Claims priority, application Japan, Aug. 17, 1981, 56-128325
Int. Cl.³ E05D *5/02*
U.S. Cl. 16—382 **1 Claim**

1. An apparatus for hinging a back door of an automotive vehicle wherein the back door includes a door glass with a hinge having a movable member and a backing member which together clamp a portion of the door glass therebetween with deformable packings respectively interposed between the glass and both the backing member and the movable member, a stationary hinge member to which the movable hinge member is pivotally connected, the stationary hinge member being fixed to the vehicle body, the improvement comprising in combination means for adjusting the clamping force on the

glass to a predetermined magnitude, the clamping force adjustment means comprising:

a first opening defined by said movable member in alignment with a second opening defined by said backing member receiving a fastening member therein to secure said movable member to said backing member;

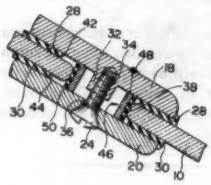
a third opening in said movable member and located about said first opening, said third opening being larger in diameter than said first opening;

a fourth opening in said door glass aligned with said first and second opening;

fifth and sixth openings defined respectively by said packings, each having a diameter greater than said fourth opening defined by said door glass; said first through sixth openings together defining a cavity in the combination of said movable member, backing member, and fastening member;

a separate ring spacer located in said cavity and extending coaxially through said fourth, fifth, and sixth openings, said ring spacer including a rigid member and a resilient member fixed to the periphery of said rigid member radially outwardly adjacent said door glass, said resilient member contacting the door glass, and said ring spacer having an outside diameter substantially equal to the inside diameter of said fourth opening and structurally adapted to accommodate the passage of said fastening member therethrough, said ring spacer having an axial length greater than the thickness of said door glass but less than the sum of the thickness of the door glass and the thickness of said packings when relaxed thereby to define a minimum distance between said movable member and said backing member, said axial length being further characterized so that when the fastening member is tightened, the fixed member and the movable member clamp said door glass therebetween with a force determined and limited by a tightening of the fastening member until said movable member and said fixed member contact said spacer,

whereby excessive force is not exerted on said door glass wherein the spacer is spaced from the screw by a gap, and the movable hinge member is formed with a boss disposed within the spacer and having a hole receiving the screw, the boss being spaced from the spacer by a gap.



4,535,504

DEVICE FOR SEVERING THE MEAT ADHERING TO BONES FROM THESE BONES

Otto Prosenbauer, Vienna, Austria, assignor to Inject Star Pokelmaschinen Gesellschaft m.b.H., Vienna, Austria

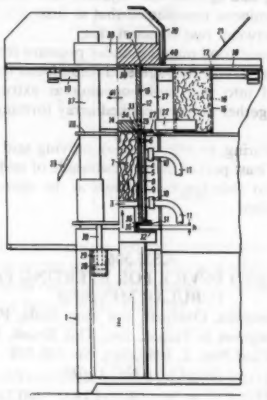
Continuation of Ser. No. 404,172, Aug. 2, 1982, abandoned. This application Oct. 1, 1984, Ser. No. 657,033

Claims priority, application Austria, Aug. 4, 1981, 3442/81

Int. Cl.³ A22C *17/00*

U.S. Cl. 17—1 G **11 Claims**

1. A device for severing meat adhering to bones from these bones by compressing the bones with the adhering meat within a press cavity having an upright axis, comprising a compressing piston being insertable into said press cavity from below and being movable within the cavity along said axis, an abutment member for closing the press cavity at its upper end during compressing the bones, said abutment member being arranged for being moved transversely to the axis of said press cavity between a position above the press cavity and a position remote thereof, a cylindrical side wall in said press cavity extending over the length of the cavity generally parallel to said axis, the side wall having openings oriented transversely to said axis for the passage of a meat mass being given a pasty condition under the action of the compressing pressure and being impermeable for the bones, a filling member having a filling cavity for the mass of meat and bones to be compressed,



and filling member being arranged for being moved transversely to the axis of said press cavity between a filling position located remote from the axis of said press cavity and a discharge position located at the area of the axis of said press cavity, said mass to be compressed falling from the filling cavity into the press cavity after having removed from said position above the press cavity said abutment member, said abutment member and filling member being movable in the same plane, said filling cavity directly adjoining said press cavity in the discharge position of said filling cavity.

4,535,505

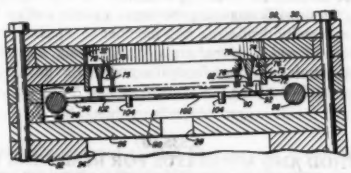
METHOD AND APPARATUS FOR FORMING A PATTY TO ACCOMMODATE TISSUE FIBER FLOW

Harry H. Holly, Boca Raton, Fla., and James A. Holly, Crestwood, Ill., assignors to Holly Systems, Inc., Boca Raton, Fla.

Division of Ser. No. 443,212, Nov. 23, 1982,. This application May 7, 1984, Ser. No. 607,965

Int. Cl.³ A22C *7/00*

U.S. Cl. 17—45 **13 Claims**



1. A method for forming a patty of plastic food material containing tissue fibers, said method comprising the steps of:

(a) providing a foraminous member having, (1) an upstream side, (2) a downstream side, (3) rows of apertures communicating between said upstream side and said downstream side with slots extending through said foraminous member connecting adjacent apertures in each row, (4) ribs on said upstream side with each rib being located generally parallel to, and between, two adjacent rows of apertures for

defining between two adjacent ribs a channel-like region communicating with one of said rows of apertures;

(b) providing means defining a food material reservoir adjacent the upstream side of said foraminous member;

(c) providing mold parts defining a mold opening and at least a portion of a mold cavity having the shape of at least a portion of the exterior surface of said patty and positioning said mold parts to dispose said mold opening adjacent said downstream side of said foraminous member;

(d) providing an agitator bar having spaced-apart teeth and disposing said agitator bar adjacent said upstream side of said foraminous member so that at least one tooth is received between two adjacent ribs;

(e) forcing said food material under pressure from said food material reservoir through said foraminous member apertures and into said mold opening as extrudate masses which together define a packed array forming said patty; and

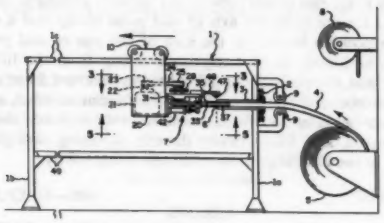
(f) before, during, or after step (e), moving said agitator bar across at least part of the upstream side of said foraminous member to dislodge tissue fibers at the upstream side of said member.

4,535,506

METHOD AND DEVICE FOR EVERTING FLEXIBLE TUBULAR MEMBER

Ivo G. M. Hendriks, Overpelt, and Theo Stals, Peer, both of Belgium, assignors to Teepak, Inc., Oak Brook, Ill.

Filed Nov. 2, 1983, Ser. No. 548,168
Int. Cl.³ A22C *13/00*
U.S. Cl. 17—45 **28 Claims**



1. A device for everting a flexible tubular member or the like comprising frictional engagement means insertable into a distal end portion of said tubular member to frictionally engage the interior surface thereof to axially displace said tubular member to a point of everting, and means for displacing everted tubular member from the point of everting over the exterior surface of the noneverted tubular member.

22. A method for everting a flexible tubular member comprising frictionally engaging the interior surface of said tubular member, axially displacing said member to a point of everting by means of said frictional engaging, everting, and displacing everted tubular member from the point of everting over the exterior surface of the noneverted tubular member.

4,535,507

METHOD AND APPARATUS FOR REMOVING LUMP MEAT FROM A CHESAPEAKE BAY BLUE CRAB

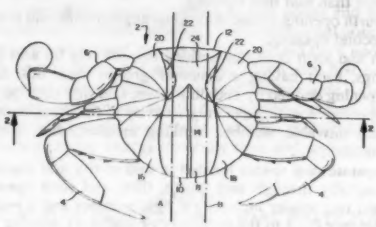
Theodore S. Reinke, Kennett Square, Pa., assignor to Sea Savory, Inc., Cambridge, Md.

Filed Oct. 12, 1983, Ser. No. 541,092
Int. Cl.³ A22C *29/00*
U.S. Cl. 17—48 **2 Claims**

1. In the processing of a cooked Chesapeake Bay blue crab having two lumps of crab meat each of which is within a cavity which is connected to a back fin by a knuckle and is bounded internally of the crab body by a bony wall extending from the back of the crab body to the carapace, the method of removing the lumps of crab meat comprising the steps of:

(a) removing the carapace, cleaning the visceral cavity, and supporting the back of the crab body,

(b) cutting the crab body from mouth end to stern end along two planes each of which passes closely outside the bony wall bounding one of the lump meat cavities and which



converge to meet at the center of the back of the crab body,

(c) removing the part of the crab body between the saw cuts, including the bony walls bounding the lump cavities, and

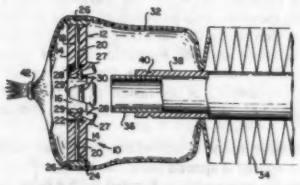
(d) removing the lump meat from each cavity through the opening formed by removal of the bony wall which bounded the cavity internally of the crab body.

4,535,508

EXPANDABLE CASING SIZING MECHANISM AND METHOD

Roger Aceto, Brookfield Center, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 30, 1984, Ser. No. 595,364
Int. Cl.³ A22C *11/02*
U.S. Cl. 17—49 **13 Claims**



1. An expandable sizing means for diametrically expanding a food casing about a stuffing horn assembly adjacent the discharge thereof prior to stuffing the casing, said sizing means comprising:

(a) a sizing member capable of fitting within an unshirred substantially unstretched portion of casing, said member having an opening therethrough to accommodate passage of the stuffing horn assembly;

(b) a radially movable rod carried by said sizing member, said rod having an inner end extending into said opening and an outer end substantially flush with the outer periphery of said sizing member;

(c) a casing contacting member on the outer end of said rod; and

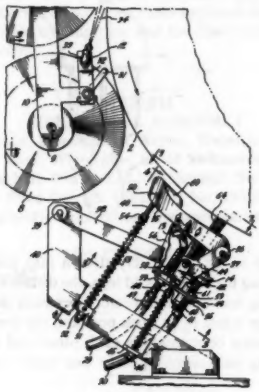
(d) lifter means on said sizing member which engages against the inner end of said rod upon passage of the stuffing horn assembly through said opening to thereby move said rod radially outward and lift said casing contacting member to a casing stretching position.

4,535,509

FISH-CLEANING MACHINE FINISHING SPRAY ACCESSORY

Kenneth W. Bullock, Seattle, and Robert J. Story, Everett, both of Wash., assignors to Smith Berger Marine, Inc., Seattle, Wash.

Filed Jul. 6, 1983, Ser. No. 511,433
Int. Cl.³ A22C *25/14*
U.S. Cl. 17—58 **8 Claims**



1. A finishing accessory for a bull ring type of fish-cleaning machine having rotatable bull rings for carrying a fish comprising a spreader bar adjacent to the periphery of the bull rings but spaced therefrom, and geniculate mounting means including a pair of links composed of a first link pivotally mounted by stationary pivot means and arranged generally parallel to the periphery of the bull rings and a second link pivotally connected to said first link in a position folded relative thereto by a pivot spaced from said stationary pivot means and arranged generally parallel to the periphery of the bull rings and supporting said spreader bar for movement toward and away from the periphery of the bull rings and for engagement with the belly cavity walls of a fish carried by the bull rings for spreading such walls apart.

4,535,510

COTTON DRYING TOWER FOR GINNERIES

Ilan Shoham, Kibbutz Einat, Israel

Filed Oct. 5, 1983, Ser. No. 539,277
Claims priority, application Israel, Oct. 15, 1982, 67002
Int. Cl.³ D01G *37/00*
U.S. Cl. 19—0.27 **7 Claims**

1. A gin drying system for controlling the moisture content of seed cotton, comprising—

a four-sided drying tower;

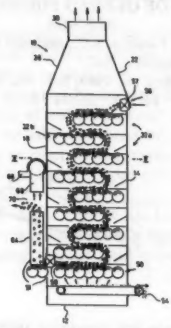
heated air supplying means provided at a lower section of the tower;

air exhaust means provided at a higher section of the tower;

seed cotton feeding means provided at a higher section of the tower;

seed cotton transferring means provided between said higher and said lower sections of the tower, said transferring means comprising two sets of horizontally extending cotton conveying means having a length less than the distance between two opposite sides of the tower, one of the sets being arranged in superimposed, spaced relationship along one of said sides and the other set being arranged in superimposed, spaced relationship along the other of said sides so that at least a centrally located portion of one of the sets is spaced from and overlaps the corresponding centrally located portions of the other set, and

means for driving the conveying means in opposite direc-



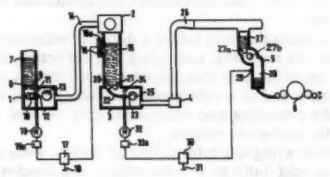
tions so that seed cotton fed to the tower will be conveyed by the conveying means of the two sets while dropping by gravity from one conveying means of one set to a lower conveying means of the other set.

4,535,511

METHOD AND APPARATUS FOR CONTROLLING AND REGULATING MACHINES OF A TEXTILE FIBER PROCESSING LINE

Ferdinand Leifeld, Kempen, and Fritz Hösel, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Apr. 1, 1983, Ser. No. 481,398
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212148; Dec. 2, 1982, 3244619
Int. Cl.³ D01H *5/38*
U.S. Cl. 19—105 **8 Claims**



2. In a regulating apparatus for regulating fiber quantities supplied to a fiber processing machine of a fiber processing line including a fiber storing apparatus connected downstream of said fiber processing machine and receiving processed fiber therefrom; said fiber processing machine including a feed roller supplying fiber to said fiber processing machine, an opening roller and a regulatable drive means for rotating said feed roller and said opening roller; the improvement comprising

(a) a sensor connected to said fiber storing apparatus for generating a sensor signal representing the fiber quantity in said fiber storing apparatus;

(b) regulator means connected to said sensor for receiving said sensor signal from said sensor and connected to said regulatable drive means for applying thereto an analog control signal for varying the rpm of said feed roller and said opening roller as a function of the fiber quantities in said fiber storing apparatus; and

(c) proportioning means operatively interconnecting said feed roller and said opening roller for proportionately

varying the rpm of the feed roller and the opening roller relative to one another.

4,535,512

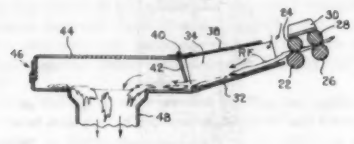
METHOD AND MEANS FOR PROVIDING ASSEMBLAGES OF OPENED FIBERS FOR INTIMATE BLENDS

Carey A. Glazener, Pickens, S.C., assignor to Platt Saco Lowell Corporation, Greenville, S.C.

Filed Sep. 26, 1983, Ser. No. 535,489

Int. Cl.³ D01G *19/14*

U.S. Cl. 19—229 **15 Claims**



1. Improved means for providing fully opened, combed, discrete and non-condensed assemblages of staple fibers for subsequent blending in admixture with other such assemblages of staple fibers of diverse type thereto, then to produce intimate blends of such fibers of diverse types and, upon yet further processing, elongate strands or yarns which have uniquely uniform admixture compositions, said means comprising:

a. separating and combing means

for separating a discrete tuft of fibers from a mass thereof and

for combing said tuft to remove impurities, foreign matter and immature fibers therefrom and to align its contituent fibers into an orientation substantially axially parallel one another while maintaining the same in a substantially non-condensed state;

b. fiber tuft engaging, advancing and disengaging means

for engaging said tuft as a discrete entity in a substantially non-condensed state,

for advancing said fully opened, combed, discrete, non-condensed tuft in a direction substantially parallel to that of the axial orientation of its constituent fibers, and then

for disengaging said tuft as a discrete entity; and

c. fiber tuft receiving, conveying and collecting means

for receiving said disengaged combed tuft as a discrete entity and in a substantially non-condensed state, and like preceding and succeeding ones thereof, individually as discrete entities,

for conveying said tufts as discrete entities while maintaining said tufts in a substantially non-condensed state during said conveying, and

for collecting said conveyed, non-condensed tufts as discrete entities; and

d. wherein said fiber tuft receiving, conveying and collecting means includes means for providing currents of air to receive said tufts disengaged by said disengaging means, to convey said received tufts to a collection chamber and there to collect said conveyed tufts in a substantially non-condensed state.

4,535,513

DETACHABLE DRAPE CLAMP

Vinko Sterle, Stari trg pri Lozu, Yugoslavia, assignor to Roland Sattler, Aufham, Fed. Rep. of Germany

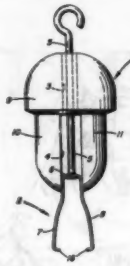
Filed May 12, 1983, Ser. No. 494,025

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, MR20 189

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—346 **4 Claims**

1. A clamp for the detachable holding of web-shaped materials, comprising a spring steel clamping strip consisting of two downwardly extending legs having lower free ends and an intermediate section interconnecting said legs at upper ends thereof, a pull bar fastened at one end to the intermediate section and an elongated slide element defining a transverse groove through a portion of said element to define two arms and a longitudinal bore through the ungrooved portion, said bar passing slidingly through said bore and permitting said



clamping strip to be completely drawn into said groove to create a bringing together of said legs, the distance between the two arms being less than the distance between the lower free ends of the legs when in an open position, the lower free ends of said legs being bent towards each other and serrated, the legs contacting said arms at only one point when in said groove.

4,535,514

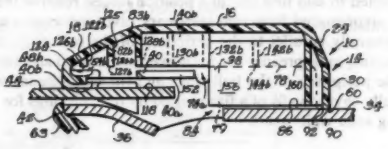
SEAT BELT WITH PLASTIC COVER

Richard M. Grabowski, Country Club Hills, Ill., assignor to Gateway Industries, Inc., Hazel Crest, Ill.

Filed Sep. 27, 1982, Ser. No. 423,813

Int. Cl.³ A44B *11/26*

U.S. Cl. 24—633 **8 Claims**



1. In a safety belt buckle, the combination comprising:

a generally channel shaped frame having a bottom wall and a pair upstanding side walls,

a tongue plate slideable along the bottom wall of the frame,

latch means mounted in the frame for movement between a latched position for holding the tongue plate against removal and an unlatched position allowing removal of the tongue plate from the frame,

a push button operator for shifting the latching means from the latched position to the unlatched position,

a bottom plastic cover for the covering the bottom wall of the channel shaped frame and having sidewalls for upwardly along the upstanding side walls of the frame, and

a one-piece plastic top cover having a shell for covering the upper open side of the channel shaped frame and having an opening exposing the pushbutton operator for operation by a user,

a plurality of side ribs on each side of the top over depending internally from the shell for engaging the side walls of the channel shaped frame and for supporting the cover shell thereabove,

said bottom cover and said top cover abutting each other adjacent the frame side walls,

a rear support having ribs depending internally at the rear of the shell for positioning to abut the frame bottom wall,

a back wall on the shell extending to abut the bottom wall of the frame at the rearward side of the buckle, and

a front support having a plurality of ribs depending internally from the shell and positioned over the tongue plate and spaced therefrom by a predetermined distance less than the distance the shell will be deflected under heavy loading so that the ribs engage the tongue plate which engages the frame bottom wall and thereby supports the front portion of the shell when deflected, said ribs being spaced with openings therebetween to reduce cross sectional thickness and to decrease mold cycling time and the distortion of the plastic during cooling.

4,535,515

DRAW-ROLL ASSEMBLY

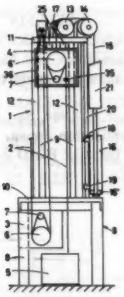
Peter Baertschi, Kriens; Kurt Wetter, Weinfelden-Hagenbuch, and Felix Graf, Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 25, 1982, Ser. No. 436,388

Claims priority, application Switzerland, Oct. 29, 1981, 6913/81

Int. Cl.³ D02J *1/22*

U.S. Cl. 28—245 **16 Claims**



1. In combination with a draw frame for filamentary material;

a pair of draw-roll assemblies for drawing filamentary material; and

a plurality of guides for guiding one of said draw-roll assemblies from an abutment defining a working position to a filament take-up position adjacent the other of said draw-roll assemblies to permit a laying on of filamentary material.

4,535,516

APPARATUS FOR THE PRODUCTION OF FIXED POINT MULTIFILAMENT YARNS

Gerhard Egbers, Reutlingen, and Helmut Weinsdorfer, Pliezhausen, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

PCT No. PCT/EP81/00123, § 371 Date Mar. 25, 1982, § 102(e) Date Mar. 25, 1982, PCT Pub. No. WO82/00668, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 13, 1981, Ser. No. 364,862

Claims priority, application Austria, Aug. 18, 1980, 4215/80

Int. Cl.³ D02J *1/08;* D02G *1/16*

U.S. Cl. 28—272 **5 Claims**

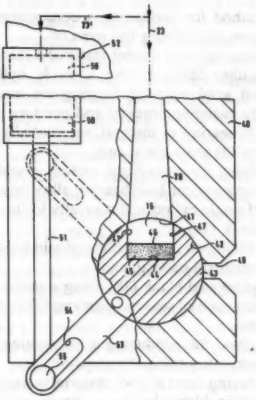
1. Apparatus for the interlacing of multifilament yarns to produce fixed point multifilament yarns, the apparatus comprising

an interlacing unit having a bore, a rotatable body arranged in said bore, a longitudinal passage for accommodating multifilament yarns during treatment therein, said passage having a longitudinal direction with a first portion formed in said rotatable body and a second position formed by a wall portion of said bore, an elongate lateral slot intersecting said bore;

means for moving the multifilament yarns through said passage under tension at speeds in excess of 1000 meters per minute;

a pneumatic positioning motor for rotating said rotatable body to position said first portion of said passage in a threading position in alignment with said slot, whereby multifilament yarns can be inserted through said slot into said first portion of said passage and whereby said lateral slot is closed by said rotatable body on rotation of said rotatable body to an operating position in which said first portion of said passage is aligned with said second portion of said passage;

a blasting nozzle in the form of De Laval nozzle having a convergent section leading to a throat and a divergent section extending through said interlacing unit to open



into said passage transversely to said longitudinal direction at an angle in the range of from 60° to 90° to said longitudinal direction, said divergent section having an opening at a junction with said passage extending peripherally of said passage in the range from 0.2 to 0.5 times the peripheral length of said passage;

gas source means for blowing gas under pressure into said De Laval nozzle to cause the gas to emerge in a stream through said opening into said passage at a desired speed to effect interlacing;

means for varying said gas pressure to select said desired speed;

a gas supply line extending from said means for varying said gas pressure to select said desired speed to said De Laval nozzle; and

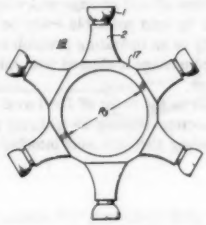
means for connecting said pneumatic positioning motor to said gas supply line whereby on supply of gas to said De Laval nozzle, said positioning motor is actuated to move said rotatable body from said threading position to said operating position.

4,535,517

METHOD FOR PRODUCING A CONNECTING ROD FOR A RADIAL PISTON MOTOR

Yoshio Iijima, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Division of Ser. No. 242,767, Mar. 11, 1981, Pat. No. 4,432,122. This application Oct. 3, 1983, Ser. No. 538,732
Claims priority, application Japan, Oct. 8, 1980, 55-141779
Int. Cl.³ B23P *15/10*
U.S. Cl. 29—156.5 A **2 Claims**



1. A method for producing a connecting rod for a radial piston motor, comprising the steps of:

(A) producing from a steel material a star-shape cylindrical monolithic blank having a single cylindrical centrally located axial opening, bearing six equally spaced outwardly radiating, integral rod portions (2), each rod portion (2) bearing an integral, substantially spherical surface portion (1) at its distal end;

(B) applying by centrifugal casting a white metal bearing alloy or a copper base bearing alloy onto an inner surface of said single cylindrical centrally located axial opening in said blank (18);

(C) machining an inner surface of said bearing alloy applied by centrifugal casting; and

(D) dividing said blank (18) along a radial axis at a position between each of said rod portions (2) and the adjacent rod portions.

2. A method for producing a connecting rod for a radial piston motor, comprising the steps of:

(A) producing from a steel material a star-shape cylindrical monolithic blank having a single cylindrical centrally located axial opening, bearing six equally spaced outwardly radiating, integral rod portions (2), each rod portion (2) bearing an integral, substantially spherical surface portion (1) at its distal end;

(B) applying by centrifugal casting a white metal bearing alloy or a copper base bearing alloy onto an inner surface of said single cylindrical centrally located axial opening in said blank (18);

(C) machining an inner surface of said bearing alloy applied by centrifugal casting;

(D) applying onto said machined surface of bearing alloy an overlay (T_2) of Pb-base alloy; and

(E) dividing said blank (18) along a radial axis at a position between each of said rod portions (2) and the adjacent rod portions.

4,535,518

METHOD OF FORMING SMALL-DIAMETER CHANNEL WITHIN AN OBJECT

Vance W. Jaqua, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 19, 1983, Ser. No. 533,680
Int. Cl.³ B21D *53/00*
U.S. Cl. 29—157 C **13 Claims**

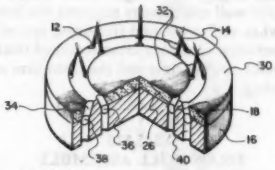
1. A method for forming channels in an object having at least one flat surface comprising the steps of:

forming at least one prominence having at least two tapered sides extending outwardly from said surface;

forming two manifold grooves, one at the intersection of each side with said surface;

forming a duct groove on each tapered side extending from the top of the prominence to the manifold groove at its base;

filling the grooves with a removable filler material;



forming a layer of material over said surface to cover the top of said prominence, said layer forming a bond with said surface, whereby a manifold and a duct are formed from said manifold groove and said each duct groove, respectively;

removing a portion of said layer to a depth sufficient to uncover said ducts; and

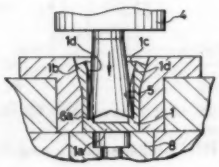
removing said filled material from said manifold and ducts.

4,535,519

METHOD OF MANUFACTURING A VALVE SLEEVE

Hiromi Kajikawa, Namegawa, and Masao Sugita, Higashi-matsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 595,791
Claims priority, application Japan, Apr. 6, 1983, 58-60530
Int. Cl.³ B21D *53/00*
U.S. Cl. 26—157.1 R **11 Claims**



1. A method of manufacturing a valve sleeve, comprising a first step of expanding one end of a cylindrical member hollow, a second step of forming a plurality of axial grooves in the internal surface of the cylindrical member leaving the opposite ends thereof intact, and a third step of restoring the expanded portion to its original diameter which it assumes before the expanding step.

4,535,520

DEVICE FOR FACILITATING REMOVAL AND INSERTION OF PLUGS IN GAS JETS IN CORE MOLDING OPERATIONS

John R. Scherer, 1251 S. Reynolds Rd., Apt. 175, Toledo, Ohio 43615

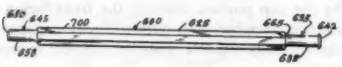
Filed Apr. 28, 1983, Ser. No. 489,363
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—235 **1 Claim**

1. A longitudinally extending tool member, with opposing first and second ends thereon, for facilitating the insertion and removal of gas jet plug members used in metal casting wherein such gas jet plug members have an open chamber, said tool member comprising:

(a) a longitudinally extending rod member having an intermediate handle portion with a base diameter, said longitu-

dinally extending rod member having a first end and a second end;

(b) longitudinally extending insert means on the first end of said longitudinal member, said insert means being of generally cylindrical configuration, said insert means having an inner end adjacent the handle portion of said rod member and an outer end on the opposing end of said insert means, and wherein said insert means has a diameter less than the base diameter of said handle portion on said rod member, said insert means having a uniform diameter over its longitudinal extent with the extreme outer end of said insert means being rounded and;



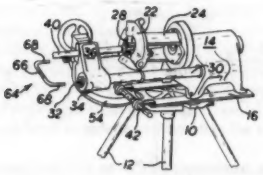
(c) a longitudinally extending removal means on the sedond end of said rod member, said removal means having an inner end adjacent the handle portion and on outer end remote from said handle portion, said removal means being cylindrically configured with a uniform diameter less than that of said handle portion between said inner and outer ends, said removal means further comprising a circumferentially extending flange at said outer end, said flange having a taper which increases towards the inner end.

4,535,521

SOCKETING MACHINE HOSE PULL

James A. VerPlanck, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Aug. 24, 1983, Ser. No. 526,013
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—235 **3 Claims**



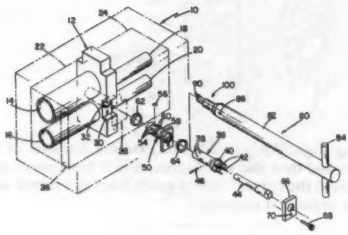
1. Apparatus for assembling a hose fitting socket having an internally spirally, serrated recess, having an axis to the end of a flexible hose, wherein the apparatus includes a frame rotatably supporting a socket holding chuck having an axis whereby the socket may be rotated about its axis, power drive means drivingly connected to the chuck, a hose clamp adapted to clamp a flexible hose, guide means mounting the hose clamp upon the frame in substantial alignment with the chuck axis for reciprocal movement toward and away from the chuck, the improvement comprising, manually operated force multiplying hose clamp translating means mounted upon the frame operatively connected to the hose clamp for selectively translating the hose clamp upon the guide means toward and away from the chuck to aid in assembling and disassembling of a chucked socket and a hose held within the hose clamp, said manually operated hose clamp translating means comprising a winch defined by a shaft rotatably mounted upon the frame below the chuck at a location closer to the chuck than the hose clamp having a length substantially perpendicular to the chuck axis and an accessible end, a flexible strand wound upon said shaft having an outer end attached to the hose clamp, and manual shaft rotating means defined on said shaft end.

4,535,522

ANALYZER MAINTENANCE

John A. Averill, Randolph, Mass., assignor to Allied Corporation, Morristown, N.J.

Filed Feb. 1, 1984, Ser. No. 575,760
Int. Cl.³ B25B *27/14*
U.S. Cl. 29—280 **4 Claims**



1. A maintenance tool for removal of a valve sleeve assembly from a valve cavity in a flow through cell of a blood gas analysis system or the like, comprising

stepped sleeve structure having a cylindrical lead portion adapted to provide support for toroidal seal members carried by said valve sleeve, a cylindrical support portion of cross sectional dimension greater than said cylindrical lead portion and corresponding to the inner cross sectional dimension of said valve sleeve assembly for aligning engagement with the inner surface of said valve sleeve, and a limit shoulder for engaging an end of said valve sleeve, said stepped sleeve structure including a bore that is eccentric with respect to the cylindrical surfaces of said lead and support portions,

a shaft disposed in said bore,

gripping structure carried by said stepped sleeve structure including a cam member at the end of said stepped sleeve structure opposite said limit shoulder portion that is movable between a retracted position and an extended position, said cam member in said extended position having a portion that extends radially beyond said cylindrical lead portion at the end of said stepped sleeve structure, and

handle structure for rotating said shaft to move said cam member between said retracted and extended positions, said stepped sleeve structure being adapted to be inserted into a valve sleeve assembly in a valve cavity with said cam member in said retracted position so that said cylindrical support portion is piloted on the inner surface of said valve sleeve assembly and then said handle structure is operated to place said cam member in said extended position so that subsequent withdrawal of said stepped sleeve structure supports and removes said valve sleeve from said valve cavity while concurrently providing support for said toroidal seal members.

4,535,523

FUEL ASSEMBLIES FOR NUCLEAR REACTORS

Joseph Leclercq, Saint Didier, France, assignor to Commissariat a l'Energie Atomique, Paris and Framatome, Courbevoie, both of, France

Division of Ser. No. 242,454, Mar. 11, 1981,. This application Jun. 3, 1983, Ser. No. 500,824
Int. Cl.³ B23P *7/00*
U.S. Cl. 29—402.08 **1 Claim**

1. A process for disassembling the guide tubes of a fuel assembly of the type in which each guide tube is fixed to the upper end part by expansions in orifices provided with annular grooves made in said part, wherein for the purpose of replacing one or more defective fuel rods during a maintainance operation the upper part of the guide tube assembly is cut out beneath the expansion, the upper part removed, the defective

fuel rods replaced, a new upper part equipped with a number of short tubes whose number is at the most equal to that of the guide tubes of the assembly is introduced, the internal diameter

thereof being slightly larger than the external diameter of the cut-out tubes and then said short tubes, which have previously been fitted on to the corresponding guide tubes are joined with the latter by expansion shaping.

4,535,524

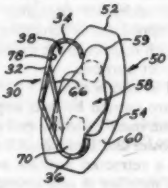
METHOD OF ASSEMBLING A RACK-SUPPORTING CHANNEL AND STOP

Thomas E. Jenkins, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Division of Ser. No. 282,107, Jul. 10, 1981, Pat. No. 4,437,715. This application Jan. 30, 1984, Ser. No. 563,278

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—453 **3 Claims**



1. A method of assembling a rack-supporting channel and stop arrangement for a structure providing a chamber having a front opening and side walls wherein there is an article-holding rack supported by rack-supporting members for inward and outward movement of the rack relative to the structure, the rack-supporting members being carried in a trackway of an elongated channel member having a side wall and upper and lower curved walls converging toward each other defining a substantially C-shaped cross section and having one end facing the front opening of the chamber comprising the steps of:

deforming a portion of the channel member side wall near its front-facing end to project inwardly into the trackway to form a retaining means; and

inserting a stop member into the front opening of the channel member, the stop member having a cap portion of enlarged cross section and a central body portion joined to the cap section by a neck portion of reduced cross section and a lateral positioning member resilient in the longitudinal direction and rigid in the lateral direction extending from the central body portion, self-biased to a normal position and flexibly movable to an assembly position, and constructed to substantially span the trackway between the uppermost and lowermost interior faces of the curved wall portions of the channel member when in its normal position and to clear that portion of the trackway within one of the curved wall portions and the side wall portion of the trackway when flexed to its assembly position, insertion of the stop member comprising the steps of

canting the stop member laterally relative to the channel member away from the trackway;

inserting a first portions of the central body portion within one of the curved portion of the trackway with the inner face of the cap portion abuttingly engaging the front-facing end of the channel member and the central body portion extending inwardly beyond the retainer means;

flexing the lateral positioning member to its assembly position;

rotating the stop member about its first portion into abutting engagement with the interior side wall portion of the channel member with the central body portion extending laterally behind the retainer means;

releasing the lateral positioning member for return to its normal position, thereby securing the stop member laterally by the capture of lateral positioning member within the curved wall portions of the channel member, inwardly by the cap portion abutting the front-facing end of the channel member, and outwardly by engagement of the central body portion with the channel member retainer means.

4,535,525

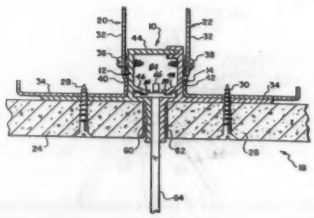
ADAPTER FOR BRACKET SECUREMENT TO WALL STUDS AND METHOD OF MANUFACTURE

David Varon, Highland Park; Steven C. Dorner, Western Springs, and Burton L. Siegal, Skokie, all of Ill., assignors to Crown Metal Mfg. Company, Chicago, Ill.

Division of Ser. No. 295,487, Aug. 24, 1981, Pat. No. 4,443,979. This application Feb. 2, 1984, Ser. No. 576,360

Int. Cl.³ B21D *39/02*

U.S. Cl. 29—463 **6 Claims**



1. A method of making an adapter for holding a slott ed standard in the form of a flat bar having longitudinally spaced slots along a center line thereof to a pair of back to-back studs in a wall construction, the adapter comprising a box-like housing having a rear wall, a pair of side walls, front wallboard supporting wings with inner extensions that stop short of one another and have right angle spaced apart parallel entrance flanges formed thereon, a pair of inwardly extending flanges spaced rearwardly of the extensions and forming therewith a split channel for receiving the flat bar and with the slots of the bar aligned with the space between the entrance flanges, said method comprising:

A. forming recesses in at least one of the faces of said flat bar between said slots and opposite parallel edges of said bar,

B. assembling the flat bar in said split channel together with said housing,

C. rolling portions of at least one of said extensions and inwardly extending flanges into said recesses between said slots and said opposite parallel edges of said bar to form locking keys for holding the flat bar and the adapter in assembly.

4,535,526

METHOD FOR COVERING A LENGTH OF PIPE

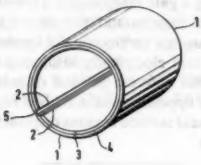
Karl C. Zerfass, and Martin Urban, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 27,648, Apr. 6, 1979, abandoned. This application Jan. 10, 1983, Ser. No. 456,983

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815049

Int. Cl.³ B21D *35/00*

U.S. Cl. 29—469.5 **12 Claims**



1. A process for using a laminated foil which is free from elastic memory, comprising the steps of:

(1) cutting from a foil web a predetermined length of foil at right angles to the longitudinal axis of said foil web, said foil consisting essentially of;

(a) a carrier layer having a thickness between 300 μm and 400 μm and comprising a polymeric material selected from the group consisting of rigid PVC, polyethylene and polypropylene,

(b) directly adjacent to said carrier layer, a single layer of adhesive having a negligibly small thickness such that it does not contribute to the rigidity of the laminate, and

(c) a layer of aluminum bonded directly to one side only of said carrier layer, said aluminum layer being directly adjacent to said adhesive layer and having a thickness between about 25 and about 100 μm,

the relative thickness of said carrier layer and said aluminum layer being selected so that the laminated foil is free from elastic memory, such that a rectangular piece of the laminated foil is capable at room temperature of both independently lying flat and of independently exhibiting a stable shape when a shape is imparted to it by bending and the laminated foil can be reversibly converted from any desired spatial shape to another and will not tend to independently alter the shape imparted to it;

(2) bending said foil, at room temperature, around a length of pipe to fit said foil in a formfitting manner to said length of pipe with said carrier layer against said pipe, said foil having an independently stable shape after said bending.

4,535,527

TOOL EXCHANGING DEVICE FOR A MULTI-SPINDLE MACHINE TOOL

Peter Fischer, and Paul Schubert, both of Aalen, Fed. Rep. of Germany, assignors to Alfing Kessler Sondermaschinen GmbH, Aalen, Fed. Rep. of Germany

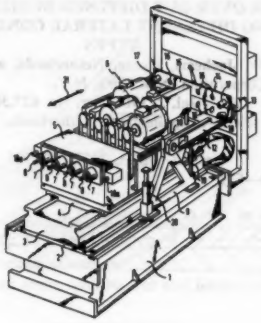
Filed Jul. 12, 1983, Ser. No. 512,953

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242439

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **19 Claims**

1. A machine tool for mounting on a lateral unit or console unit of a transfer machine, and comprising: a spindle unit; a plurality of processing spindles; drive elements for the spindle unit; a tool support for the receipt of used and new tools, each corresponding in number to the number of spindles, said tool support having means for holding both used tools of said number and new tools of said number disposed to align with said processing spindles, and movable mounting means carrying the tool support for moving said tool support from a charging position on the rear of the machine tool, over the spindle unit



and the associated drive elements, to a tool exchange position in front of said processing spindles.

4,535,528

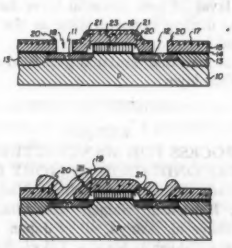
METHOD FOR IMPROVING REFLOW OF PHOSPHOSILICATE GLASS BY ARSENIC IMPLANTATION

Devereaux C. Chen, Mt. View, and Horng-Sen Fu, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 2, 1983, Ser. No. 557,577

Int. Cl.³ H01L *21/95, 21/283*

U.S. Cl. 29—571 **32 Claims**



1. A method of smoothing a layer comprising a phosphosilicate glass layer having a step profile in a semiconductor device comprising the steps of:

implanting arsenic into said layer; and

reflowing said layer by heating said layer sufficiently to smooth said layer.

12. A method of making a semiconductor device comprising the steps of:

forming a region of another conductivity type in a substrate of one conductivity type;

forming an insulator layer comprising a phosphosilicate glass layer on said substrate;

implanting arsenic into said insulator layer;

forming a contact window through said insulator layer for allowing a metal coverage contact to said region of another conductivity type; and

reflowing said insulator layer by heating said insulator layer sufficiently to smooth said insulator layer.

4,535,529
METHOD OF MAKING SEMICONDUCTOR DEVICES BY FORMING AN IMPURITY ADJUSTED EPITAXIAL LAYER OVER OUT DIFFUSED BURIED LAYERS HAVING DIFFERENT LATERAL CONDUCTIVITY TYPES

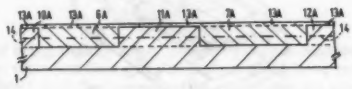
Pieter J. W. Jochems, Heeze, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

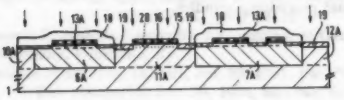
Filed Jul. 2, 1984, Ser. No. 627,308

Claims priority, application Netherlands, Jul. 5, 1983, 8302383

Int. Cl.³ H01L *21/20, 21/225*

U.S. Cl. 29—571 **10 Claims**





1. A method of manufacturing a semiconductor device comprising the steps of forming at least a first buried layer of a first conductivity type by introducing a dopant into a surface of a semiconductor substrate, growing onto said substrate an epitaxial layer having a lower overall doping in atoms/cm^2 than said buried layer, forming a region of said first conductivity type in said epitaxial layer by diffusion from said buried layer, and providing surface adjoining semiconductor zones of a semiconductor circuit element in said region,

wherein the improvement comprises the steps of

limiting said diffusion into said epitaxial layer to form a surface layer of said epitaxial layer having substantially the same doping concentration as the original epitaxial layer, and

providing at least one insulated gate field effect transistor in said surface layer.

4,535,530
PROCESS FOR MANUFACTURING A SEMICONDUCTOR MEMORY DEVICE

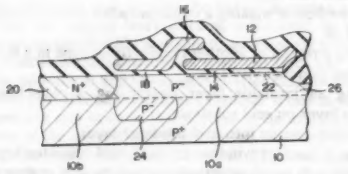
Masahiko Denda, Kobe; Shinichi Sato, Nishinomiya; Natsuro Tsubouchi, Kawanishi; Shigeji Kinoshita, Itami, and Yoshikazu Ohbayashi, Ashiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 267,521, May 27, 1981, abandoned. This application Apr. 5, 1984, Ser. No. 596,577

Claims priority, application Japan, Jun. 3, 1980, 55-75206

Int. Cl.³ H01L *21/425, 21/265*

U.S. Cl. 29—571 **3 Claims**



1. A process of manufacturing a semiconductor memory device comprising the steps of: selectively implanting, into a main surface of a semiconductor substrate of a first type of conductivity, a second type of conductivity forming impurity so as to form impurity implanted regions of said first type of conductivity which are higher in resistivity than said semiconductor substrate; epitaxially growing surface regions on said semiconductor substrate including said impurity implanted regions, said surface regions being similar in resistivity to said impurity implanted regions; forming a bit line region of said second type conductivity in said surface regions except for a portion of said surface regions which are disposed on said impurity implanted regions, said bit line region reaching said semiconductor substrate from the surface of said surface regions; and forming a gate electrode of a transfer gate transistor above said surface regions and also above said impurity implanted regions through an electrically insulating material and forming through said electrically insulating material an electrode of a capacitor above a portion of said surface regions which are located opposite to said bit line region with respect to said portion of said surface regions disposed on said impurity implanted regions.

4,535,531
METHOD AND RESULTING STRUCTURE FOR SELECTIVE MULTIPLE BASE WIDTH TRANSISTOR STRUCTURES

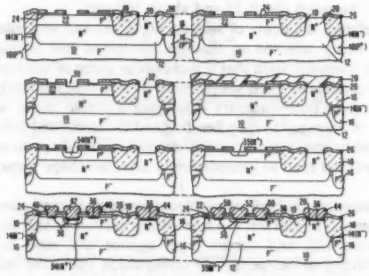
Harsaran S. Bhatia, Wappingers Falls; Jack A. Dorler, Poughkeepsie; Santosh P. Gaur; John S. Lechaton, both of Wappingers Falls; Joseph M. Mosley, Hopewell Junction, and Gurumakonda R. Srinivasan, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,730

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.³ H10L *21/302, 21/22*

U.S. Cl. 29—577 C **15 Claims**



1. A method for making an integrated circuit having two bipolar transistor types each having different operating speeds and amplification characteristics due to said transistor types being formed of different base widths, said method comprising:

providing a monocrystalline silicon substrate having a pattern of regions of said silicon isolated from one another by a dielectric pattern on one major surface of said substrate;

providing a subcollector region within said silicon and spaced from said major surface;

forming a base region in at least certain of said regions of silicon down to said subcollector region wherein said base region has a surface concentration of more than about 1×10^{18} atoms/cm^3;

forming a block-out mask ovér said major surface in regions where said transistor type of lower said characteristics are desired;

subjecting in areas uncovered by said block-out mask the said base regions wherein an emitter region is planned to

be formed to reactive ion etching to form a depression having a depth between about 70 to 100 nanometers;

removing said block-out mask;

forming an emitter region in said etched portion of said base regions and in unetched base regions which were in areas covered by said block-out mask and heating said emitter region wherein the intrinsic base regions are formed of different base widths; and

making electrical contact to each of the elements of said bipolar transistor types.

4,535,532

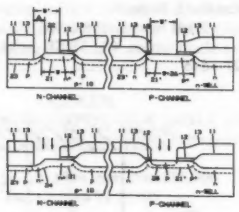
INTEGRATED CIRCUIT CONTACT TECHNIQUE

Loren T. Lancaster, Allentown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 9, 1984, Ser. No. 598,179

Int. Cl.³ H01L *21/265, 29/78;* **B01J** *17/00*

U.S. Cl. 29—576 B **14 Claims**



1. Technique for forming contact to semiconductor impurity regions of opposite conductivity type comprising the steps of:

forming a p-type impurity region in an n-type substrate region of a semiconductor substrate,

forming an n-type impurity region in a p-type substrate region of said semiconductor substrate,

forming an insulating layer over said impurity regions,

forming a first opening in said insulating layer exposing at least a portion of said p-type impurity region,

forming a second opening in said insulating layer exposing at least a portion of said n-type impurity region and a portion of said p-type substrate,

implanting n-type impurities into said first and second openings at a level sufficient to convert the exposed portion of said p-type substrate to n-type but insufficient to convert said exposed portion of said p-type region to n-type.

4,535,533

CABLE CONNECTOR SEATING TOOL

James J. Grammas, Westchester; Walter J. Moskal, Chicago, and Craig J. Witt, Schaumburg, all of Ill., assignors to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 19, 1983, Ser. No. 562,879

Int. Cl.³ B23P *19/02*

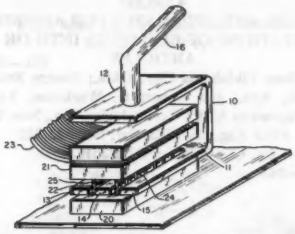
U.S. Cl. 29—749 **2 Claims**

1. A generally "U" shaped tool for facilitating the insertion of a multi-contact miniature connector having a pair of parallel rows of contact pins into a complimentary receptacle and comprising:

a base portion and a spaced apart pair of parallel arms attached thereto and adapted to receive a connector body therebetween;

a first of said arms including a first outer tine, a central tine and second outer tine, said central tine thus limiting inward displacement and said outer tines preventing any outward displacement of the contact pins of a contained connector,

a second of said arms including a handle attached thereto for ease of handling said tool, said handle comprises a rod



slanted at an angle with its free end leaning toward said base portion.

4,535,534

METHOD OF MOUNTING A SWITCH BODY ON A PRINTING WIRING BOARD OR PANEL

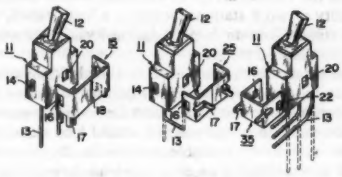
Shigeo Ohashi, and Hiroyuki Suga, both of Tokyo, Japan, assignors to Nihon Kaiheiki Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 284,913, Jul. 20, 1981, abandoned. This application Oct. 4, 1983, Ser. No. 538,878

Claims priority, application Japan, Jul. 31, 1980, 55-109354

Int. Cl.³ H01H *9/00, 11/00*

U.S. Cl. 29—832 **12 Claims**



1. A method of mounting an miniature switch on a printed wiring board or panel using one of a plurality of a different brackets, comprising the steps of:

(A) preparing a rectangular switch body having a plurality of terminals of round flexible wire rods and provided at its four outer side surfaces with first engagement members;

(B) preparing more than two different cross-sectionally C-shaped brackets of a resilient metal plate, each having a plurality of legs and provided at opposite side surfaces of said bracket with second engagement members;

(C) preparing a plurality of different inserting mounts having a mount frame with at least three side walls engageable with at least three side surfaces of said switch body, flanges outwardly extending in opposite directions from upper portions of two opposite side walls of said mount frame, elastic plates upwardly extending from those portions of the outer surfaces of said opposite side walls of said mount frame which are below said flanges, and second engagement members provided on opposite portions of said side walls;

(D) selecting one of the brackets or the inserting mounts of steps (B) and (C) above in accordance with an intended position of the printed wiring board or panel;

(E) mounting said switch body to said selected bracket or inserting mount by engaging the second engagement members of the selected bracket or inserting mount with selected portions of the first engagement members of the switch body; and

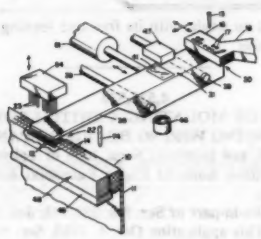
(F) mounting said switch body together with said selected bracket or inserting mount onto the printed wiring board or panel.

4,535,535

METHODS AND APPARATUS FOR ASSEMBLING PERMUTATIONS OF ELEMENTS INTO OR ONTO ARTICLES

David R. Dines, Oklahoma City, Okla.; George Svoboda, Sun City West, Ariz., and Robert G. Workman, Yukon City, Okla., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,222
Int. Cl.³ H05K *3/00*; B23P *19/00*
U.S. Cl. 29—845 **18 Claims**



1. An apparatus for positioning a number of elements arranged in various first predetermined arrays on articles at element receiving sites which are in an array large enough to encompass the various arrays of elements, which comprises:

a plurality of work stations including a load station, an unload station, and an inspect station located between the load and unload stations;

a fixture located at the unload station for holding an article having the array of receiving sites;

means proximate to the load station for feeding a succession of elements into a load position at said load station;

a carrier selectively movable relative to the plurality of work stations having an array of element receiving holes corresponding to the array of element receiving sites on the article; an elongated bar longitudinally extending between the load station and the unload station and slidably positioned beneath said carrier for supporting the elements in said carrier receiving holes;

means including a programmed controller for moving the carrier relative to the load position to receive in said receiving holes a predetermined array of elements from said feeding means;

means located at the inspect station for sensing the array of elements loaded into the carrier to determine if the array of received elements is in accordance with the predetermined array and for generating one out-of-three different control signals; the controller operating said moving means (i) to advance the carrier from the inspect station to overlay said fixture in response to a first control signal of said three different signals, or (ii) to return the carrier from the inspect station to the load station in response to a second control signal of said three different signals, or (iii) to shift the carrier out of the inspect station in response to the third control signal of said three different signals; and

means located at the unload station rendered effective upon said carrier being advanced to overlay the fixture for transferring the array of elements from the carrier receiving holes to the element receiving sites on the article held in the fixture.

17. A method of inserting a predetermined permutation of plugs in an array of holes formed in an article comprising the steps of:

loading a permutation of plugs in a transfer carrier, at a load station;

moving the transfer carrier to an inspection station;

sensing the absence of plugs in the permutation at the inspection station;

returning the transfer carrier to the load station upon sensing one or more missing plugs from the permutation;

loading the transfer carrier with additional plugs in accordance with the sensing of the absence of plugs and returning the transfer carrier to the inspection station;

advancing the transfer carrier to an insertion station only upon ascertaining the presence of the predetermined permutation of plugs; and

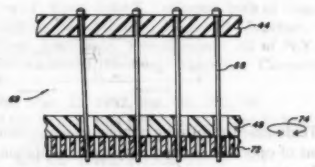
inserting the permutation of plugs advanced to the insertion station into the array of holes in an article positioned in the insertion station.

4,535,536

METHOD OF ASSEMBLING ADAPTOR FOR AUTOMATIC TESTING EQUIPMENT

Robert P. Wyss, Manhattan Beach, Calif., assignor to Augat Inc., Mansfield, Mass.

Filed Nov. 3, 1983, Ser. No. 548,422
Int. Cl.³ H05K *3/00*
U.S. Cl. 29—845 **3 Claims**



1. A method for fabricating an adaptor for automatic testing equipment comprising the steps of:

aligning a first plate having a plurality of apertures each having a first size and arrayed in a first pattern that conforms to the pattern of an electronic circuit device to be tested with a second plate having a plurality of apertures each having a second size larger than the first size and arrayed in a second pattern that corresponds to the pattern of the terminals of the electronic circuit device to be tested such that confronting ones of the apertures of the first and second plate are coaxially aligned;

disposing a plurality of rigid probes each having tail portions through respective ones of said confronting aligned apertures in the first and second plates;

displacing the second plate a selected distance in a selected direction in the plane defined by the plane of the second plate;

positioning a third plate having apertures arrayed in a third pattern that conforms to the pattern of the signal contacts of a universal test fixture proximate the tails of the rigid probes; and

vibrating the second plate controlably in the plane defined by the second plate such that corresponding ones of the tails are received in preselected ones of the apertures of the third plate.

4,535,537

DISPOSABLE PLASTIC RAZOR

Frank A. Ferraro, Trumbull, Conn., and David S. Byrne, Atlantic Highlands, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 12, 1984, Ser. No. 649,643
Int. Cl.³ B26B *21/14*
U.S. Cl. 30—32 **5 Claims**

1. A one-piece plastic razor cartridge comprising a blade

support including a face-engaging guard bar, a plurality of spaced posts projecting from said support, a perforated blade having a cutting edge disposed upon said support so that said posts project through mating perforations and said cutting

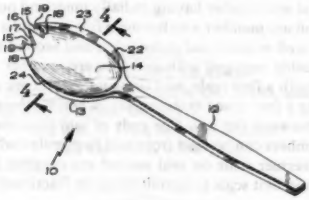
edge projects toward said guard bar, each post terminating in a predetermined configuration so as to develop collectively a contoured face-engaging surface which in combination with said guard bar and blade develop optimum blade edge geometry and means for securing the blade to the blade support.

4,535,538

COMBINATION NON-DISPOSABLE TABLE UTENSIL

Shelby W. Nelson, 170-15th Ave. Northeast, Minneapolis, Minn. 55413

Filed Apr. 10, 1984, Ser. No. 598,906
Int. Cl.³ A47G *21/06*
U.S. Cl. 30—147 **2 Claims**



1. A non-disposable eating utensil molded from an inert plastic material, comprising:

a handle of sufficient rigidity to withstand vigorous manual pressure and having a concave-convex scoop at one end, said scoop being generally in the shape of a spoon;

tines extending outwardly from one end of said scoop, said tines functioning generally in the manner of a fork;

said scoop having first and second edges and a basin bowl, said first edge being parallel to the plane of said handle and beveled along its length to function as a knife, and capable, under rocking pressure, to sever food, said first edge being nonserrated to prevent injury to the mouth of a user, said scoop having a smoothly uninterrupted concave upper surface;

said handle being centered proportionally between said first and second edges of said scoop so as to provide balance; and

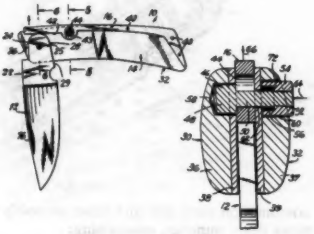
said scoop including a plurality of indentations between said tines, said indentations including a short and a long edge, said short and long edges being connected by a downwardly sloping edge, said indentations cooperating with said tines so that the upper surface of the latter is co-extensive with the upper concave surface of the scoop thereby maximizing surface area for containment of liquid materials within said basin bowl of said scoop.

4,535,539

FOLDING KNIFE WITH SAFETY LOCKING FEATURE

Harry Friedman, Franklin Lakes, N.J.; Isao Sengoku, Seki, Japan; Yukiro Hattori, Seki, Japan, and Minoru Isikawa, Seki, Japan, assignors to Jet AER Corporation, Paterson, N.J.

Filed Mar. 13, 1984, Ser. No. 589,159
Int. Cl.³ B26B *1/04*
U.S. Cl. 30—161 **16 Claims**



1. A foldable knife comprising:

a handle having a longitudinal recess and an opening perpendicular to said recess and communicating therewith, said opening being open-ended on one side of the handle;

a blade having a cutting edge at the front end and a tang at the rear end, said tang having first and second camming surfaces;

means for securing said blade to said handle for pivotal movement between a closed position wherein the cutting edge is received in the recess and an open position wherein the cutting edge is exposed;

a bar spring secured at one end to the handle in the recess, the free end of the bar spring being adjacent the first camming surface in the open position and the second camming surface in the closed position, said bar spring having a hole therein generally aligned with said opening in said handle;

a mechanism secured in said opening and extending through said hole, said mechanism comprising an enlarged portion and a reduced portion, means for moving said mechanism between a locking position wherein said enlarged portion is in said hole for limiting movement of said bar spring under the urging of said first or second camming surfaces for preventing movement of the blade to the closed or open positions respectively, and a release position wherein said reduced portion is in said hole and sufficient movement of said bar spring is accommodated under urging of said first or second camming surfaces for moving said blade to said closed or open positions, respectively; and

means for biasing said mechanism to said locking position;

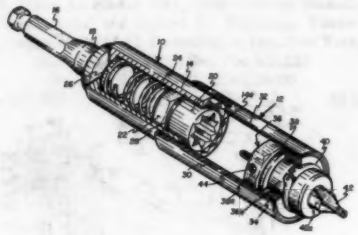
wherein said mechanism moving means comprises a push button secured to the end of said reduced portion opposite said enlarged portion, said push button being accessible through said open end of said opening, and wherein the open-ended side of said opening includes an enlarged section and a reduced section, said reduced section being dimensioned to receive said reduced portion of said mechanism but not said enlarged portion, wherein said biasing means comprises a coil spring disposed about said reduced portion and seating at one end on a shoulder defined between said enlarged and reduced sections of said opening and at the other end against said push button, and wherein the opening in said handle is close-ended on the other side thereof.

4,535,540

"HOLE-IN-ONE" METAL PUNCH DRIVE UNIT

Michael J. Morgan, 8500 Central, SE., Unit 16, Albuquerque, N. Mex. 87123, and Steven G. Gray, 3921 Doroteo Pl., NE., Albuquerque, N. Mex. 87111

Filed Mar. 14, 1983, Ser. No. 475,119
Int. Cl.³ B26F *1/00*
U.S. Cl. 30—358 **5 Claims**



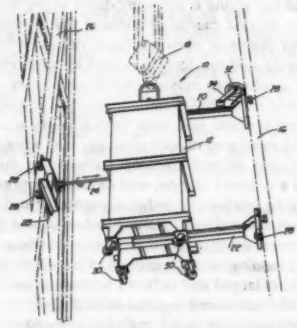
1. A combination pilot drill and drive assembly for use with one or more draw punches, comprising:
   - a drill unit including a tubular casing and a drill chuck for holding a pilot drill rotatably mounted at one end thereof, said drill chuck including a hex head located inside said dirve casing; and
   - a drive unit including a tubular large diameter first socket and a relatively smaller diameter second socket slidably engaged therein, said second socket being springloaded so as to be normally urged outwardly toward the open end of said first socket;
   - said casing of said drill unit being sized to fit over said first socket of said drive unit, and said hex head of said drill chuck being sized to engage said first socket, whereby said drill unit may be selectively coupled to said drive unit for use of said drill and drive units in combination in a first mode of use as a pilot drill for drilling a pilot hole in a metal panel, and whereby said drill unit may be removed from said drive unit for use of said drive unit alone in a second mode of use to engage by means of one of said sockets a draw punch for punching a hole in a metal panel.

4,535,541

DEVICE FOR MEASURING GUIDE ALIGNMENT FOR MINE SHAFTS AND THE LIKE

Francis A. Penning, Denver, Colo., assignor to Colorado School of Mines, Golden, Colo.

Filed Mar. 26, 1984, Ser. No. 593,693
Int. Cl.³ G01C *9/00*; E21B *47/02*
U.S. Cl. 33—1 H **14 Claims**



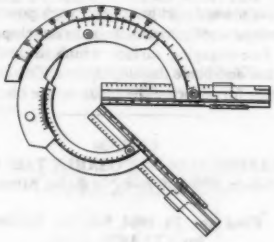
1. A guide alignment measuring device adapted for being raised and lowered in a vertical or inclined shaft and engaging one or more guides, the device comprising:
   - a housing having an instrument shelf therein;
   - a first contact arm attached to the housing and engaging a reference guide; and
   - a first inclination means received on the instrument shelf for measuring a first tilt angle of the instrument shelf from the vertical as the device is raised and lowered.

4,535,542

VERNIER GAUGE

Bao-Shen Liu, and Bao-Horng Liu, both of 3rd Fl., No. 20, Alley 6, Lane 190, Chung 12th Rd., Tien Mu District, Taipei, Taiwan

Filed Oct. 24, 1983, Ser. No. 544,467
Int. Cl.³ G01B *3/38*
U.S. Cl. 33—148 E **24 Claims**



1. A vernier gauge comprising:
   - a first arc member having a free end and a clamped end; and said first arc member having radially inner and outer sides, a second arc member also having a free end and a clamped end as well as inner and outer sides, said second arc member slidably engaged with said first arc member and provided with a first scale, said first and second arc members defining a free space at the center, whereby the stretched angle between the two free ends of said first and second arc members can be read from said first scale and wherein a first vernier scale on said second arc member is placed along said first scale to permit accurate fractional reading.

4,535,543

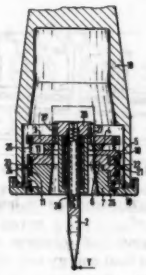
DYNAMIC FEELER HEAD

Kurt Linder, Karlsruhe, Fed. Rep. of Germany, assignor to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 533,009
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1982, 3234851
Int. Cl.³ G01B *3/22*
U.S. Cl. 33—169 R **4 Claims**

1. A dynamic feeler head having four side edges for use in measuring units and machine tools, comprising a feeler head housing having one end with a recess, a plurality of plates having side edges some of which are disposed in an X-plane and some of which are disposed in a Y-plane, said plates comprising a first, second, third, fourth and fifth plate disposed in said recess and arranged in superposed juxtaposition, tension springs means connected to said plates for holding said plates in superposed juxtaposition, a feeler pin carried by said plates, and support spring means connected between said plates and said feeler pin for permitting a linear movement of said feeler pin along a Z-axis, a plurality of spring members forming tilting axis hinges and interconnecting adjacent ones of said plates to each other, said plates having lever arms between said feeler pin and said tilting axis hinges which are of mutually equal lengths, each of said second, third, and fourth plates being hinged by its respective lever arm and through a respec-

tive tilting axis hinge to both a respective superjacent plate and, on a side offset through 90°, to a respective subjacent plate so that feeler pin is tiltable with respect to ones of said plates about respective coordinate directions in the X and Y plane, said tilting axis hinges all being spaced from said feeler pin by a known distance, said plates each having side faces all of



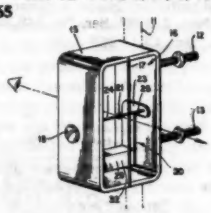
which are equidistantly spaced from said feeler pin which is centrally arranged with respect to said plates, said side faces extending parallel to the coordinate directions in the X and Y plane, all of said tilting axis hinges lying in a common plane with one of said tilting axis hinges extending in each of said four side edges of the feeler head.

4,535,544

SIGHTING APPARATUS

Thomas F. Jones, Rte. 2, Adairsville, Ga. 30103, and Jesse L. Morehead, Rte. 1, Rydal, Ga. 30171

Filed Jul. 6, 1982, Ser. No. 395,407
Int. Cl.³ F41G *1/34, 1/46*
U.S. Cl. 33—265 **9 Claims**



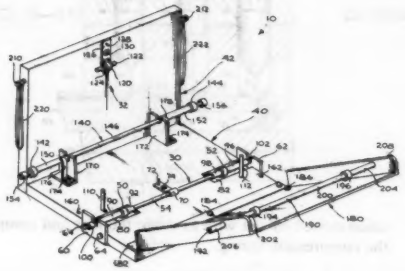
1. An improved bow sight apparatus comprising:
a housing defining an opening therethrough;
a sight assembly including two substantially vertical plate members disposed in parallel spaced apart relation,
said sight assembly further comprising means for emitting a point of light suspended between said plate members;
a power source mounted on said sight assembly for supplying electrical energy to said light-emitting means; and
means for suspending said sight assembly within said opening defined by said housing for pendulous movement about a horizontal axis spaced apart from said light-emitting means and from the center of gravity of said sight assembly, said power source being mounted below said axis.

4,535,545

INSPECTION DEVICE AND METHOD FOR CYLINDRICAL WORK PIECES

Larry H. Becnel, West Covina, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Nov. 21, 1983, Ser. No. 554,836
Int. Cl.³ A61B *5/08*
U.S. Cl. 33—550 **39 Claims**



1. A device for checking the concentricity of a cylindrical workpiece, comprising:
first reference support means for rotatably supporting said workpiece at a first location on the outer perimeter of said workpiece, said first reference support means establishing a fixed reference point from which a measurement of the diameter of said workpiece may be taken as said workpiece is rotated to determine the concentricity of said workpiece;
second reference support means for rotatably supporting said workpiece at a second location on the outer perimeter of said workpiece, said second location being defined by a tangent to said workpiece orthogonal to the tangent to said workpiece at said first location, said second reference support means maintaining said workpiece to allow said measurement of the diameter of said workpiece to be taken;
a base member rigidly mounting the first and second reference support means at said first and second locations, respectively; and
biasing means hingedly attached to the base member for removably maintaining said workpiece in contact with said first and second reference support means.

4,535,546

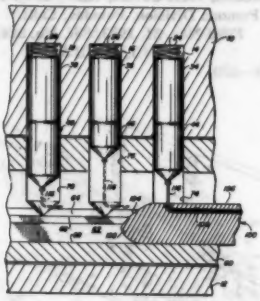
LOCKSMITH TOOL APPARATUS FOR DETERMINING LENGTH OF LOCKING ELEMENTS IN LOCKS

Rodney D. Smith, 6550 N. 2nd Dr., Phoenix, Ariz. 85013

Filed Feb. 27, 1984, Ser. No. 583,679
Int. Cl.³ G01B *5/20*
U.S. Cl. 33—540 **18 Claims**

1. Locksmith tool apparatus usable with a lock having a key way, a tumbler pin, a driver pin, and a compression spring biasing the driver pin and the tumbler pin, comprising, in combination:
key blade means, including a key blade for insertion into the key way of the lock;
a wire having a tip movably disposed on the key blade means;
handle means secured to the key blade means;
indicator means movably disposed on the handle means and secured to the wire for moving the wire to move the

tumbler pin and the driver pin to compress the compression spring to a minimum length and to measure the distance moved by the wire to move the pins and compress the compression spring.



4,535,547

MOUNT FOR AN EARTH MAGNETISM SENSOR FOR USE IN AN AUTOMOTIVE VEHICLE

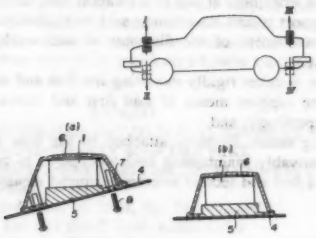
Norimitsu Kurihara, Saitama; Toshiyasu Suzuki, Tokyo; Takashi Iwanaga, and Masaru Hisadomi, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,415

Claims priority, application Japan, Feb. 4, 1981, 56-15155; Jun. 2, 1981, 56-84846

Int. Cl.³ G01C *17/38*

U.S. Cl. 33—356 **3 Claims**



1. A method of mounting an earth magnetism sensor adapted to detect a horizontal component of the earth magnetism for a bearing detecting apparatus, on a vehicle, comprising the step of:

mounting said earth magnetism sensor in a horizontal position within a mount member mounted on a sloped bonnet portion of the vehicle, at a location at which an orientation of magnetic field, which is generated when the vehicle body becomes magnetized, crosses a horizontal plane substantially at a right angle;

said location being substantially intermediate with respect to the vehicle height, proximal the front end of said vehicle, and substantially at or near a longitudinal center line of said vehicle; and

said earth magnetism sensor being mounted at said location such that an axis of detecting a primary direction of said sensor is horizontally angularly offset by a number of degrees corresponding to a terrestrial magnetic declination at a given observation point with respect to a desired orientation by way of a map.

4,535,548

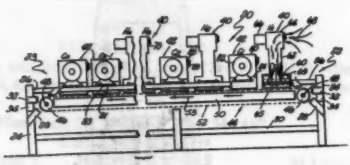
METHOD AND MEANS FOR DRYING COATINGS ON HEAT SENSITIVE MATERIALS

James L. Hyde, Palos Verdes Estates, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Oct. 25, 1982, Ser. No. 436,213

Int. Cl.³ F26B *3/30*

U.S. Cl. 34—4 **2 Claims**



1. A method for drying coatings on heat sensitive materials, comprising the steps of:

subjecting the coated heat sensitive material to alternate sources of radiant heat energy and relatively cool air; and

maintaining the time of exposure to each source and the amounts of heating and cooling of the respective sources at levels sufficient to significantly decrease the time needed to dry the coating while limiting the temperature increase of said material to a level insufficient to deform or distort said material including the surfaces thereof; and wherein:

said radiant heat energy is effective to heat said coating by direct radiation thereof; and

said coated heat sensitive material has a heat reflecting layer between the coating and the heat sensitive material and said radiant heat energy is reflected away from said heat sensitive material and is effective to further heat the coating indirectly by radiant heat energy reflected back into said coating by said reflective layer.

4,535,549

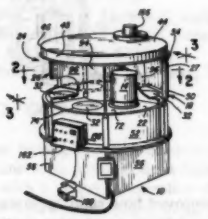
CURING APPARATUS

Louis A. Lala, Skokie, and James H. Frenchy, Chicago, both of Ill., assignors to American Screen Printing Equipment Company, Chicago, Ill.

Filed Nov. 2, 1983, Ser. No. 548,207

Int. Cl.³ F26B *3/30*

U.S. Cl. 34—4 **15 Claims**



10. A method for curing ink on exterior surfaces of articles by exposing the articles to a radiation source at a curing station within a housing, the method comprising the steps of:

inserting the articles one by one through an opening in the housing and placing each article on a horizontally disposed spin table rotatably supported upon a horizontally disposed turntable within the housing either manually or mechanically;

rotating the turntable to bring each of series of compartments on the table to transport the articles in a circular path successively past the radiation source within the housing;

selectively rotating each spin table about a vertical axis as it passes through the curing station and past the radiation source while the turntable continues to rotate; and

removing the articles one by one from their associated spin tables as the turntable continues to rotate.

4,535,550

PROCESSING OF PARTICULATE MATERIAL

Karl H. Walter, Henley South, Australia, assignor to Adelaide & Wallaroo Fertilizers Ltd., Adelaide, Australia

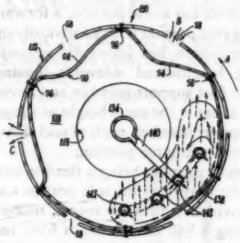
PCT No. PCT/AU82/00125, § 371 Date Apr. 11, 1983, § 102(e) Date Apr. 11, 1983, PCT Pub. No. WO83/00546, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 6, 1982, Ser. No. 488,539

Claims priority, application Australia, Aug. 10, 1981, PF0152

Int. Cl.³ F26B *3/04*

U.S. Cl. 34—33 **22 Claims**



1. Apparatus for processing of particulate material, said apparatus comprising: a vessel including a cylindrical shell having its axis inclined to the horizontal so that one end is raised relative to the other end, a respective end plate at each end of the shell, and means for charging processing gas into the shell from a source thereof; said vessel being open at said ends to enable particulate material solids to be charged continuously through said one end thereof into the shell and to enable said solids to be discharged continuously from the other end thereof; said shell being rotatable on said axis so that a tumbling bed of particulate solids is formed and retained during rotation substantially within a second one, in the direction of said rotation, of first and second lower quadrants of the shell; said gas charging means comprising a gas supply pipe passing into the vessel through an end thereof, and at least one discharge conduit in communication with the gas supply pipe and extending within and along substantially the full length of the shell; the at least one gas discharge conduit being fixed, within said second quadrant, against rotation with the shell, and having port means comprising a plurality of outlets spaced along its length; the at least one conduit being fixed within said second quadrant at a location such that, during rotation of the shell, the at least one conduit is within said tumbling bed and mechanically disperses particulate material of the bed by engagement therewith, and at a location such that the at least one conduit is spaced from, and discharges said gas outwardly toward, said shell to cause the gas to be discharged within said bed and to effect contact between said gas and particulate material of the bed at substantially below the elutriation velocities for particles of said material.

4,535,551

TRANSFER APPARATUS

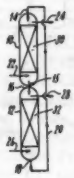
Michiel J. Groeneveld, Oldenzaal; Albert B. Verver, Huissen, and Willibrordus P. M. Van Swaaij, Losser, all of Netherlands, assignors to James Howden & Company, Glasgow, Scotland

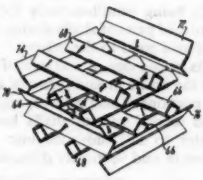
Filed Mar. 14, 1984, Ser. No. 589,635

Claims priority, application Netherlands, Sep. 15, 1982, 8203577

Int. Cl.³ F26B *17/14*

U.S. Cl. 34—170 **13 Claims**





1. Transfer apparatus comprising, in combination:

a. a vessel defining a vertically extending contact chamber having upper and lower parts;

b. a solids inlet in the upper part of said vessel for solid particulate material;

c. a solids oulet in the lower part of said vessel for solid particulate material;

d. a fluid inlet in the lower part of said vessel;

e. A fluid outlet in the upper part of said vessel;

f. A plurality of layers of bars extending generally horizontally across said vessel, at a level below the solids inlet and fluid outlet and above the solids outlet and fluid inlet, the bars of each layer being substantially parallel to one another and having a spacing between adjacent bars which is substantially the same for the bars of that layer, the parallel bars of each layer extending transversely, at an angle to the parallel bars of the adjacent layer or layers, said bars being effective to give an even distribution of solid particulate material over the cross-section of the contact chamber as it flows downwardly in said contact chamber and an even distribution of fluid over the cross-section of the contact chamber as it flows upwardly in said contact chamber.

4,535,552

SPAGHETTI DRYER

Gregory K. McManus, San Mateo, and Masato Otani, Hayward, both of Calif., assignors to Microdry Corporation, San Ramon, Calif.

Filed May 12, 1983, Ser. No. 493,996

Int. Cl.³ F26B *19/00*

U.S. Cl. 34—236 **13 Claims**

1. In combination,

a drying oven,

a first pair of spaced apart, parallel shafts respectively having an external, generally helical groove therein,

said first pair of shafts extending in a vertical direction,

a plurality of rods each having spaced apart portions respectively located in said grooves,

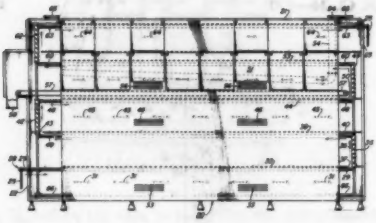
drive means for rotating said shafts in synchronism to move

said rods in a direction parallel to said shafts through said oven,

a second pair of spaced apart, parallel shafts respectively having an external groove therein,

said second pair of shafts being horizontally disposed,

transfer means for transferring said rods from the grooves of one of said pairs of shafts to the grooves of the other of said pair of shafts during the transfer thereof from one of said pairs to the other,



said rods being simultaneously located in said grooves of both of said pairs of shafts during the transfer thereof from one of said pairs to the other,

the shafts in said one of said pair of shafts extend in proximity to the shafts in said other of said pair of shafts, and

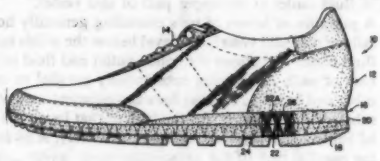
the end portions of said grooves adjacent said vertical shafts in said second pair of shafts having an increasing base diameter to lift said rods into the lower ends of the grooves in said vertically disposed shafts.

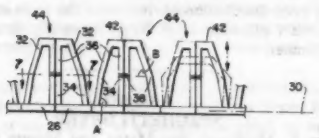
4,535,553

SHOCK ABSORBING SOLE LAYER

Thomas Derderian, Exeter; Edward C. Frederick, Kingston, both of N.H., and Alexander L. Gross, Aspen, Colo., assignors to Nike, Inc., Beaverton, Oreg.

Filed Sep. 12, 1983, Ser. No. 531,087
Int. Cl.³ A43B *13/18*
U.S. Cl. 36—28 **41 Claims**





1. A shock absorbing member for use in a sole of footwear comprising:

a plurality of elongate base elements interconnected to delineate the base perimeters of a plurality of interconnected open cells;

a plurality of elongate flexible legs extending from said base elements in a plurality of groups of elements converging toward one another to define a plurality of generally conical shaped projections; and

a plurality of connecting elements, each connecting the convergent ends of said flexible legs of one of said conical shaped projections, whereby a load placed on said base elements or said connecting elements causes said flexible legs to resiliently flex to absorb said load.

4,535,554

MOLDED FOOTWEAR

Marcos G. De Obaldia B., P.O. Box 9-089, Panama 9, Panama

Filed Aug. 17, 1983, Ser. No. 524,061
Claims priority, application Panama, Jan. 25, 1983, 032057
Int. Cl.³ A43B *5/1*
U.S. Cl. 36—113 **13 Claims**

13. An article of footwear, comprising,

a body member, a foot support member and a harness member,

said body member being a flexible integrally molded plastic member which has a sole portion, a forward portion with a toe cup, a rear portion with a forwardly open pocket and a heel cup which has forwardly extending side flaps, upstanding longitudinal sidewalls located on opposite sides of the foot support member and having upper edges which are about at the same height as the upper surface of the foot support member, each of said sidewalls having an upwardly extending tab portion,

said foot support member being a flexible integrally molded member which overlies the sole portion and has an upper surface provided with a toe recess, recess means for accommodating a ball of a wearer's foot, recess means for accommodating the heel of a wearer's foot, and a raised arch support portion, said foot support member having a rear portion retained in said forwardly open pocket of the body member,

said harness member being connected to the body member and being operable to retain the body member on a wearer's foot, said harness member being a piece of flexible molded elastic plastic material which has a soft texture for the comfort of a wearer, said harness member having generally horizontal straps and inclined straps which are inclined downwardly and rearwardly, said generally horizontal straps being connected to the side flaps of the heel cup, said inclined straps being connected to the tab portions of said sidewalls;

said article of footwear being open from the toe cup to the harness to expose a wearer's foot.

4,535,555

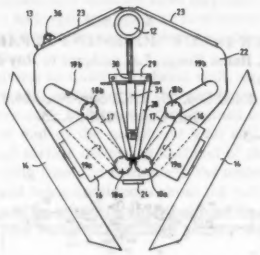
TRENCHER WITH PLURAL DIGGING WHEELS HAVING ADJUSTABLE INCLINATION

Gilles Petraud, Moncoutant, France, assignor to Cerimon, Moncoutant, France

Filed Feb. 28, 1984, Ser. No. 585,215
Claims priority, application France, Mar. 4, 1983, 83 03602
Int. Cl.³ E02F *5/08*
U.S. Cl. 37—94 **9 Claims**

1. A machine for digging and cleaning out trenches comprising a frame, a support carried by the frame, two cutters having a frustoconical shape and axes of rotation which are inclined to the horizontal, mounting means mounting said cutters on said support and comprising, for each cutter, a housing carrying

guide rollers, slots defined by said support and having different inclinations, said rollers being guidedly engaged in said slots, means for adjusting the inclination of said axes for the purpose



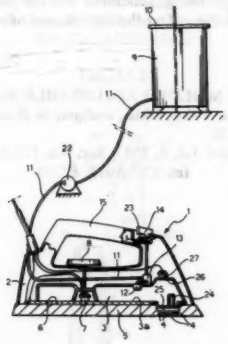
of modifying the inclination of walls of the trench to be produced, said means for adjusting the inclination comprising a jack mounted in said support, and links connecting said jack to said housings.

4,535,556

STEAM IRONING APPARATUS WITH A SEPARATE WATER RESERVOIR

Alfredo Cavalli, 9, Via G. Galilei, Pessano Con Bornago, Milan, Italy

Filed Feb. 22, 1984, Ser. No. 582,461
Claims priority, application Italy, Mar. 1, 1983, 20966/83[U]; Mar. 22, 1983, 21223/83[U]
Int. Cl.³ D06F *75/12*
U.S. Cl. 38—77.6 **6 Claims**



1. Steam ironing apparatus comprising a steam iron having a body provided with a hand-grip, a steam generating evaporation chamber within said body, an ironing plate attached to said body and provided with a plurality of through holes in fluid communication with said chamber, and a unit for supplying water to said steam generating chamber wherein the improvements consist in said unit comprising:

a water reservoir structurally independent of said iron;

a water supply duct providing liquid communication between said reservoir and said steam generating chamber in said steam iron;

a cut-off valve carried by said steam iron and connected in said duct,

a manual valve control located on said hand-grip of said steam iron and operatively connected to said valve for operating the latter;

a pump in said duct operatively connected to said manual control so as to be rendered operative when said cut-off valve is opened; and

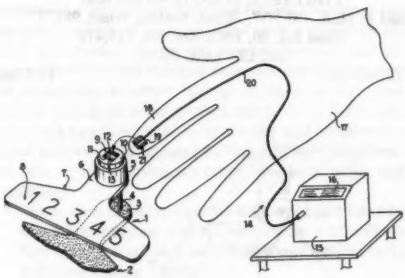
a spray nozzle connected within the body of said steam iron to said water supply duct through said cut-off valve, said spray nozzle being disposed in said steam generating chamber to supply liquid thereto in spray form; said ironing plate being provided with a recessed steam manifold communicating with said steam generating chamber having a base which is structurally independent of said ironing plate and being povided internally with a steam duct having an open end close to the top of said chamber, the other end of said steam duct opening outside the chamber into said steam manifold.

4,535,557

LABEL FOR THE IDENTIFICATION OF OBJECTS AND APPARATUS FOR USING SAID LABEL

Alain Porcher, Vitre, France, assignor to Societe Nouvelle Rockall France S.A., Vitre, France

Filed Feb. 23, 1982, Ser. No. 351,366
Claims priority, application France, Oct. 7, 1981, 81 18862
Int. Cl.³ G09F *3/00*
U.S. Cl. 40—300 **3 Claims**



1. An apparatus for the identification of a large number of objects in combination with a label, said label comprising a support element for carrying information, means for attaching said support element to the object to be identified, the support element having a region of information for receiving intelligible data concerning the object, a region carrying items of information which are not directly intelligible to unauthorized persons, and electronic means in said region carrying unintelligible items of the information, said electronic means being for processing said information and comprising a semi-conductor circuit which permits the storage and the reading of data relating to the object, said apparatus comprising a portable device for communicating with said electronic means for processing the information and a device connected to said portable device for utilizing the information recorded on said labels, said portable communication device comprising a glove having fingers, said semi-conductor circuit comprising contact elements and one of said fingers carrying contact means for application against said contact elements.

4,535,558

CARTRIDGE HOLDER

Vladimir Benesh, 14036 95th Ave., NE., Bothell, Wash. 98011

Filed Mar. 16, 1984, Ser. No. 590,156
Int. Cl.³ F42B *39/04*
U.S. Cl. 42—89 **5 Claims**

1. A cartridge holder which comprises a substantially annular flat member having a plurality of separate radially extending outward extensions, said extensions formed from the end portions of substantially arcuately shaped resilient bands, the outer ends of adjacent bands being joined by flexible bars, said bands opening outwardly so that when the end portion of a

standard cartridge is pressed between any two extensions, the resilient band encompasses and conforms to a substantial portion of the circumference of said cartridge, securing said cartridge to said flat member, adjacent extensions being flexible in a circumferential direction when cartridges are positioned therein, so that said cartridges can move relative to each other upon insertion into a cylinder.

4,535,559

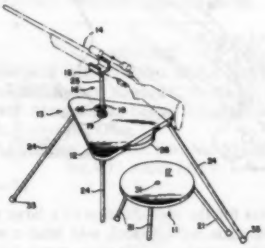
PORTABLE SHOOTING BENCH

Michael F. Hall, 328 NW. 202nd, Seattle, Wash. 98177

Filed Jul. 20, 1983, Ser. No. 515,475

Int. Cl.³ F41C *29/00*

U.S. Cl. 42—94 **16 Claims**



1. Apparatus for optimizing the accuracy of shooting of rifles, comprising:

a rifle support apparatus comprising:

means for mounting said support apparatus,

a bracket,

a table having a top,

said top having a hole for accomodation of said means for mounting said support apparatus,

said hole having an axis normal to said top and a center,

said means for mounting said support apparatus comprising:

a plurality of parts and

a subassembly of some of said plurality of parts,

said subassembly including a shaft having a first, longitudinal axis and a hole having a second axis normal to said first axis,

said means for mounting said support apparatus further comprising:

means for adjusting the position of said shaft linearly along said first axis and means for adjusting the position of said shaft rotationally about said first axis,

said bracket being pivotally attached to said shaft at said hole having said second axis, and being adjustable about said second axis,

said means for mounting said support apparatus being attached in said hole,

in said top of said table with said first axis coincident with said axis of said hole in said top of said table,

whereby the position of a rifle inserted into and supported by said apparatus is rotationally adjustable about said second axis of said shaft, linearly adjustable along said first axis normal to said top of said table and rotationally adjustable about said first axis.

4,535,560

DUCK DECOY MOVEMENT APPARATUS

Jack O'Neil, Baton Rouge, La., assignor to Roy & Kiesel, Baton Rouge, La.

Filed Sep. 27, 1982, Ser. No. 424,074

Int. Cl.³ A01M *31/06*

U.S. Cl. 43—3 **5 Claims**

1. An apparatus for creating life-like movements in floating decoys comprising:

(a) a submersible frame comprising two arcuately-shaped tubular members hingedly connected to one another at their ends to which said decoys are attached by flexible lines,

(b) an elastic band anchored at one end away from said frame, said band being attached at its opposite end to said frame, and

a motor having a reel attached to a shaft of said motor for reeling in and out a reel line attached at one end to said frame and attached at is opposite end to said reel, wherein said motor is provided which turn said motor on and off at time intervals which are vareid by voltage to said timers, said voltage being generated by the backspin on said motor shaft caused by the contraction of said elastic band.

4,535,561

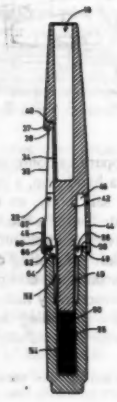
TWO PIECE MOLDED ADJUSTABLE ROD HANDLE

Lorens G. Hlava, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 5, 1963, Ser. No. 510,728

Int. Cl.³ A01K *87/06*

U.S. Cl. 43—22 **3 Claims**



1. A telescoping fishing rod handle for mounting a rod and a fishing reel of the type having an elongate mounting foot

with forwardly and rearwardly directed legs, each leg tapering toward a free end, comprising:

a foregrip having a rearwardly opening slot for reception of the forwardly directed leg of the reel foot, a sloping wall surface extending from the entrance to the slot into the slot, a longitudinally directed stem threaded at least partially along its length and an outer continuous wall which in conjunction with the stem, forms an annular, cylindrical recess; and

a buttgrip having an outer peripheral wall, an annular forwardly opening undercut for the reception of the rearwardly directed leg of the reel foot defined cooperatively between an end of the peripheral wall and the stem, a sloping wall surface defined at said end of the peripheral wall extending from the entrance to the undercut into the undercut and being continuous about the periphery of the undercut, and an internally threaded bore for mating with the stem, the buttgrip extending within the cylindrical recess,

said foregrip and buttgrip being adjustably movable, each toward and away from the other in a lengthwise direction by effecting relative rotation between the foregrip and buttgrip about a longitudinal axis,

the forwardly and rearwardly directed, tapering legs being of a dimension to wedge respectively within the slot and the undercut,

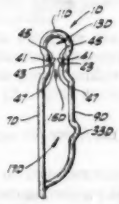
the adjustment of the buttgrip and foregrip toward each other captures the foot in a mounted position between the sloping walls of the slot and the undercut and adjustment of the foregrip and buttgrip away from each other permits the reel foot to be freed for disassembly of the reel.

4,535,562

DEVICE FOR ATTACHING A HOOKED ITEM FOR CATCHING FISH OR THE LIKE TO A LINE WITH A KNOT THEREIN

Jewell C. Fry, Rte. 2, Box A-18, Osage Beach, Mo. 65065

Filed Mar. 25, 1983, Ser. No. 478,694
Int. Cl.³ A01K *83/00*
U.S. Cl. 43—44.95 **1 Claim**



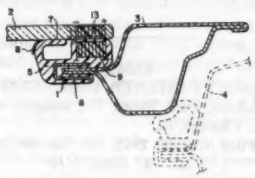
1. A device for attaching a hooked item for catching fish or the like to a line with a knot therein, said line having a predetermined diameter, said device being generally U-shaped having first and second side portions and an end portion joining the side portions, said device further having a first section near the end portion with a width between the side portions at least as great as the diameter of the line, a second section adjacent said first section with a width between the side portions less than the width of the first section, a third section adjacent the second section with a width between the side portions at least as great as the diameter of the line, and the end of one side portion opposite the end portion being joined to the hooked item, a latch disposed between the side portions of the second section, said latch comprising two latch elements, one latch element being attached to the inside of one side portion of the second section and the other latch element being attached to the inside of the other side portion of the second section, said latch elements being adapted for permitting the line to be pulled from the third section through the second section to the first section and preventing the line from slipping back from the first section through the second section to the third section.

4,535,563

WINDOW SEAL

Francois Mesnel, Neuilly-sur-Seine, France, assignor to Etablissements Mesnel, Carrieres-sur-Seine, France

Filed Nov. 8, 1983, Ser. No. 550,041
Claims priority, application France, Nov. 8, 1982, 82 18659
Int. Cl.³ E06B *7/16*
U.S. Cl. 49—478 **10 Claims**



1. A seal for a movable window, said window being mounted in a supporting structure having a window opening and being capable of movement between a closed position in which said window covers said window opening, and an open position in which said window uncovers said window opening, said supporting structure having an outer surface, and said window having an outer surface substantially flush with said supporting structure outer surface when said window is in said closed position, said opening having an inner peripheral edge and said window having an outer peripheral edge, said seal comprising:

a first portion mounted to at least a part of said inner peripheral edge, said first portion comprising: a flexible body, a first magnetic element received in said flexible body, and a flexible sealing member;

a second portion mounted to at least a part of said outer peripheral edge in a position to face said first portion and to contact said flexible sealing member when said window is in said closed position, said second portion comprising: a casing member, and a second magnetic element received in said casing member; and

flocking connected to at least one of said first and second portions, said flocking being positioned between said contacting area of said first and second portions when said window is in said closed position for reducing friction between said first and second portions to facilitate sliding of said window in said window opening;

wherein at least one of said first and second magnetic elements is a permanent magnet.

4,535,564

WEATHERSTRIP MOUNTABLE IN A SLOT

Charles Yackiw, Fairport, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Nov. 9, 1983, Ser. No. 550,481
Int. Cl.³ E06B *7/16*
U.S. Cl. 49—489 **13 Claims**

1. An elongate weatherstrip comprising:

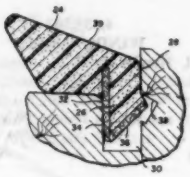
an elongate sealing body of resilient foamed synthetic resin material,

said sealing bodyhaving a pair of elongate sealing and anchoring lobes joined by a narrow elongate rib portion of resilient foamed synthetic resin material;

a thin flexible moisture resistant coating covering at least said sealing lobe and said rib portion; and

a flexible elongate hook-shaped anchoring member of a

material less compressible than said synthetic resin material enclosing at least a portion of said anchoring lobe and



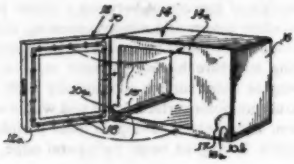
resiliently biased into an open position by said resin material.

4,535,565

GASKET FASTENER ARRANGEMENT

Lloyd A. Erickson, Park Ridge, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 26, 1983, Ser. No. 498,387
Int. Cl.³ E06B 7/16
U.S. Cl. 49—493 **8 Claims**



1. In combination, a one-piece, integrally formed clip for securing an elongate compressible gasket of given cross-sectional dimensions to a panel and a clip-receiving aperture in the panel, said clip comprising: means defining a bight portion dimensioned for receiving said elongate gasket therewithin; a pair of resilient leg portions integrally joining said bight portion and normally extending outwardly therefrom in substantially parallel, spaced apart relation; said legs respectively terminating in substantially similar, oppositely outwardly diverging resilient barb portions; said barb portions diverging generally in the direction of said bight portion for resisting removal with respect to said through panel aperture; said aperture comprising a single, continuous aperture including means for permitting ingress of said legs and associated barb portions therethrough but substantially resisting removal thereof; and said leg portions include a pair of complementary and similar inwardly converging surfaces spaced apart from said bight portion, whereby a compressive forced applied to said strap results in said compressible gasket urging said leg portions substantially mutually outwardly.

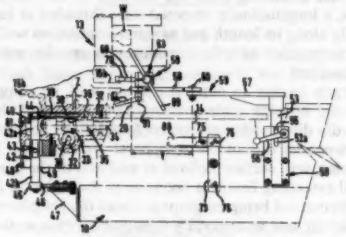
4,535,566

APPARATUS FOR MOVING A TOOL IN A CONTROLLED MANNER

Peter H. H. Soper, Rugby, and Andrew S. Cammack, Estover, both of Great Britain, assignors to Autoflow Engineering Limited, Warwickshire, England

Filed May 10, 1983, Ser. No. 493,331
Claims priority, application United Kingdom, May 10, 1982, 8213396
Int. Cl.³ B24B 13/00, 17/02
U.S. Cl. 51—124 L **11 Claims**

1. Lens generating apparatus comprising a bed, a mounting pivotally mounted on the bed, a tool carrier supported on the mounting for pivotal movement therewith along a first path, and means for sliding the carrier along a second path generally transverse to the first path as a result of movement of the carrier along the first path, the tool carrier comprising a fixed first section on said mounting and a second section pivotally mounted on the first section to enable the orientation of the



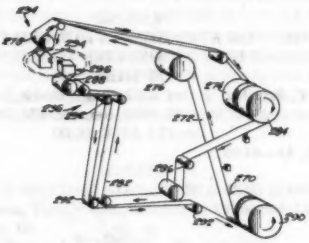
tool relative to a workpiece, and adjustment means for pivoting the second section relative to the first section as a result of said movement of the carrier along the first path.

4,535,567

COMPUTER MAGNETIC MEDIA BURNISHER

Paul E. Seaborn, Los Gatos, Calif., assignor to Seaborn Development, Inc., San Jose, Calif.

Filed Aug. 26, 1983, Ser. No. 526,966
Int. Cl.³ B24B 21/00
U.S. Cl. 51—140 **5 Claims**



1. A device for burnishing floppy disks, said device comprising:

a frame;

means mounted on the frame for supporting and rotating the disks;

a first burnishing roller mounted on the frame and positioned relative to the disk supporting means so that the roller will lie proximate a disk mounted on said supporting means, said roller being capable of receiving a burnishing tape and supporting said tape to contact the disk;

an air nozzle directed at and spaced-apart from the first burnishing roller so that an air stream emerging from the nozzle will urge a disk mounted on the supporting means against the burnishing tape on the roller; and

means for directing an airstream through the nozzle.

4,535,568

BELT SANDER

Charles H. LaFave, 11500 SW. Denny Rd., Beaverton, Oreg. 97005

Filed Nov. 18, 1983, Ser. No. 553,046
Int. Cl.³ B24B 21/00
U.S. Cl. 51—148 **7 Claims**

1. A belt sander comprising:

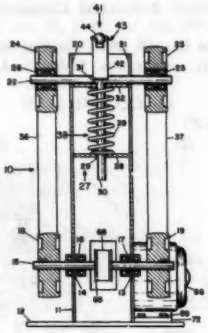
a vertical casing having two horizontally opposing vertical slots;

an idler shaft passing through said slots;

a first idler pulley mounted external to the casing on one end of the idler shaft for rotation about an axis;

a first power driven, rotatable drive pulley, externally mounted on the casing, having a fixed, horizontally disposed rotation axis;

a lower alignment plate mounted in the interior of the casing and having a vertical bore;



an upper alignment plate slideably mating the interior of the casing and having a vertical bore;

a guide shaft slideably mating the vertical bores of the upper and lower alignment plates and attached to the idler shaft; and

means for positioning the idler pulley rotational axis with respect to the drive pulley rotational axis to tension a belt trained about the drive and idler pulleys.

4,535,569

ARRANGEMENT FOR STARTING-UP A POSITION REGULATOR OF A GRINDING WHEEL SUPPORT

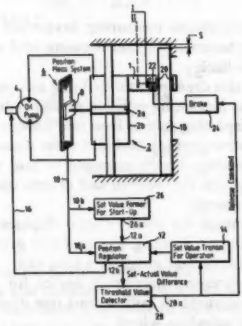
Guy-Francois Blanc, Zürich, and Fritz Loehrer, Bäch, both of Switzerland, assignors to Maag Gear-Wheel and Machine Company, Zürich, Switzerland

Filed Sep. 24, 1982, Ser. No. 423,436

Claims priority, application Switzerland, Oct. 1, 1981, 6346/81

Int. Cl.³ B24B *49/00*

U.S. Cl. 51—165.9 **9 Claims**



1. An arrangement for regulating the start-up of a position-regulated displaceable grinding wheel support, comprising;

a linear motor which does not have any self-locking action and serves to move the grinding wheel support out of a defined rest position thereof;

a position measuring system detecting the defined rest position of said grinding wheel support;

a position regulating system regulating the position of said grinding wheel support during a start-up phase and during an operational phase of the positional regulation thereof;

said position measuring system being operatively connected with said position regulating system;

brake means operatively associated with said grinding wheel support;

a retaining element defining a predetermined displacement path;

said brake means acting upon said retaining element such that said brake means engage said retaining element in said defined rest position of the grinding wheel support which thus is supported at said retaining element; and

said brake means being operatively connected to said position regulating system such that, during said start-up phase of said positional regulation of said grinding wheel support and starting from said defined rest position thereof, a start-up set position is determined by means of a small start-up distance which is selected within said predetermined displacement path defined by said retaining element, and such that said operational phase of the positional regulation of said grinding wheel support is started and said brake means are released at said start-up set position of said grinding wheel support.

4,535,570

MACHINE FOR BEVELING

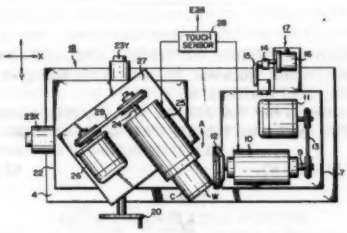
Nobuo Ochiai, Kawasaki, and Takashi Tsumagari, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 4, 1983, Ser. No. 491,645

Claims priority, application Japan, May 4, 1982, 57-73357; Jul. 1, 1982, 57-112561

Int. Cl.³ B24B *49/02*

U.S. Cl. 51—165.77 **13 Claims**



1. An apparatus for machining the periphery of an electrically nonconductive workpiece, comprising:

a grinding wheel with an electrically conductive grinding surface,

means for holding either said workpiece or, an electrically conductive test piece having a predetermined bevel,

moving means for changing the relative distance between said holding means and said wheel,

touch sensor means for generating a touch signal when the bevel of said test piece held by said holding means electrically contacts the grinding surface of said wheel, and

control means coupled to said touch sensor means and to said moving means, for detecting, when said touch signal is generated, machining end position data (N1) corresponding to the relative distance between said holding means and said wheel, and for actuating, when said workpiece is held by said holding means, said moving means according to said machining end position data (N1), so that machining of the periphery of said workpiece is effected.

4,535,571

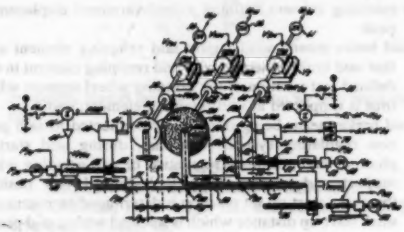
GRINDING CONTROL METHODS AND APPARATUS

Roderick L. Smith, Rockford, Ill., assignor to Energy-Adaptive Grinding, Inc., Rockford, Ill.

Division of Ser. No. 249,192, Mar. 30, 1981, abandoned. This application Feb. 15, 1984, Ser. No. 580,242

Int. Cl.³ B24B 53/00

U.S. Cl. 51—165.87 34 Claims



1. The method of restoring the face of a grinding wheel which has deteriorated from the desired shape, said method comprising

rotating the wheel and feeding the wheel face into relative rubbing contact with the operative surface of a truing element, said surface conforming to the desired shape for the wheel face, the hardness of the truing element material being less than the hardness of the grit material of the wheel, and

said method being characterized by and including

conjointly establishing the relative surface speed of said rubbing contact and relative infeed rate of said element and wheel to make the ratio W'/TE' greater than 1.0, where W' and TE' are the volume per unit time rates of removal of materials from the wheel and element, respectively.

4,535,572

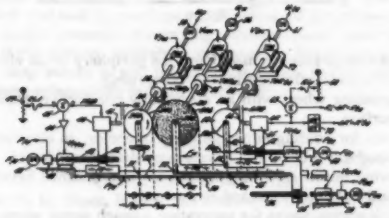
GRINDING CONTROL METHODS AND APPARATUS

Roderick L. Smith, Rockford, Ill., assignor to Energy-Adaptive Grinding, Inc., Rockford, Ill.

Continuation of Ser. No. 249,192, Mar. 30, 1981, abandoned. This application Feb. 15, 1984, Ser. No. 580,601

Int. Cl.³ B24B 53/00

U.S. Cl. 51—165.87 93 Claims



1. The method of restoring or maintaining the face of a grinding wheel in a desired shape or sharpness, said method comprising:

rotating the wheel and relatively feeding the wheel face into relative rubbing contact with the operative surface of a truing element, said surface conforming to said desired shape, and

said method being characterized by and including

controlling said relative motions of said wheel and element to make the specific truing energy ratio fall within a preselected range.

4,535,573

PROFILING APPARATUS FOR A GRINDING WHEEL IN A GEAR GRINDING MACHINE

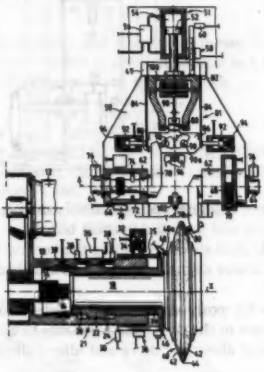
Milton Mesey, Wallisellen; Roman Shewaighofer, Geroldswil, and Meinrad Donner, Nuolen, all of Switzerland, assignors to Maag Gear-Wheel & Machine Company Limited, Zurich, Switzerland

Filed Dec. 16, 1983, Ser. No. 562,085

Claims priority, application Switzerland, Dec. 24, 1982, 7543/82

Int. Cl.³ B24B 53/00

U.S. Cl. 51—165.87 12 Claims



1. A profiling apparatus for at least one substantially ring-shaped flank of a grinding wheel having a grinding wheel axis in a gear grinding machine, comprising:

at least one dressing tool for dressing the substantially ring-shaped flank of the grinding wheel;

a radial slide displaceable at substantially right angles relative to said grinding wheel axis;

said at least one dressing tool being arranged at said radial slide;

radial drive means for relative radial displacement between said at least one dressing tool and said grinding wheel at substantially right angles relative to said grinding wheel axis;

a radial displacement measuring device for measuring the radial displacement of said dressing tool relative to said grinding wheel;

said at least one dressing tool defining an operative position and a wear measuring position at said radial slide;

means for displacing said at least one dressing tool between said operative position and said wear measuring position;

a wear measuring device arranged at said radial slide by means of which the wear of said at least one dressing tool can be measured;

axial drive means for relative axial displacement between said at least one dressing tool and said grinding wheel in the direction of said grinding wheel axis;

an axial displacement measuring device for measuring the axial displacement of said at least one dressing tool relative to said grinding wheel;

control means for coordinating said relative radial and axial displacements of said dressing tool and said grinding wheel in correspondence to a desired flank profile of said substantially ring-shaped flank of said grinding wheel; and

said control means increasing said relative axial displacement of said dressing tool and said grinding wheel essen-

tially by the amount of the wear of said at least one dressing tool.

4,535,574

SANDING TOOL AND METHOD OF MAKING SUCH TOOL

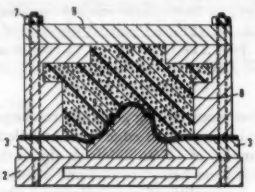
Alfred Dettelbach, Stuttgart, and Gerhard Gresser, Oberboihingen, both of Fed. Rep. of Germany, assignors to REICH Spezialmaschinen GmbH, Nuertingen, Fed. Rep. of Germany

Filed Oct. 25, 1982, Ser. No. 436,311

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144077

Int. Cl.³ B24D *15/00*

U.S. Cl. 51—204 **4 Claims**



1. A sanding or finishing tool, comprising a molded, cured foam material body having a longitudinal dimension, said body having at least one profiled surface contour for supporting abrasive or finishing material, an intermediate layer of elastic material having said abrasive or finishing material secured to one of its surfaces, said intermediate layer of elastic material having initially a substantial ability to expand in a direction across said longitudinal dimension for assuming precisely said profiled surface contour, said elastic material of said intermediate layer remaining sufficiently elastic or flexible in said direction across said longitudinal dimension even with the abrasive or finishing material secured thereto for precisely hugging said profiled surface contour, said intermediate layer being bonded with its other surface to the profiled surface contour of said foam material body as a result of the foaming and curing of the foam material.

4,535,575

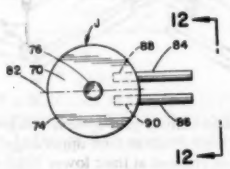
MOUNTING APPARATUS FOR PROCESSING LENS BLANKS

Frank D. Sorrells, Knoxville, Tenn., assignor to Cole National Corporation, Cleveland, Ohio

Filed Dec. 2, 1982, Ser. No. 446,412

Int. Cl.³ B24B *13/02*

U.S. Cl. 51—216 LP **11 Claims**



1. An adapter for holding a lens blank and lens block assembly in a fining and polishing apparatus comprising:

an adapter body having opposite faces, a non-circular socket extending into said body from one of said faces for receiving a correspondingly shaped projection on a lens block, said socket providing a lens block base line reference axis;

guide means projecting laterally from the outer periphery of said adapter body parallel to said axis for cooperation with locating means on the fining and polishing apparatus to prevent rotation of said body and thereby maintain a desired orientation of the reference axis, said guide means including a pair of guide rods extending outwardly from the outer periphery of said body adjacent each other in a parallel spaced-apart relationship on opposite sides of said reference axis, said locating means extending between said two guide rods; and,

a substantially centrally located recess extending into said body from the other face thereof and adapted for receiving an associated pin on an associated spindle pressure arm of the fining and polishing apparatus.

4,535,576

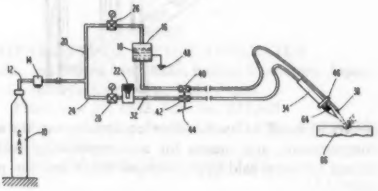
ANTI-STATIC PROCESS FOR ABRASIVE JET MACHINING

Rahul B. Shukla, and Douglas L. Shipman, both of Piscataway, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 28, 1984, Ser. No. 594,169

Int. Cl.³ B24C *3/32*

U.S. Cl. 51—413 **13 Claims**



1. Abrasive jet machining apparatus for removing portions of a workpiece comprising,

a gas supply and means for containing said gas supply,

an abrasive powder supply communicating with said gas supply, and means for containing said abrasive powder supply,

means for providing a powder stream from said gas and abrasive powder,

an electrically conducting electrolyte solution, connected to a ground, communicating with said gas supply, and means for containing said electrolyte solution,

means for simultaneously delivering said powder stream and solution to said workpiece portions whereby build-up of static charges on said workpiece are instantaneously discharged to said ground through said electrolyte solution connected to said ground.

4,535,577

OFFICE PANELLING SYSTEM

Adrian Tenser, Markham, Canada; Alfred J. Prizlow, and Gerald I. Peters, both of Warren, Mich., assignors to Global Upholstery Company Limited, Downsview, Canada

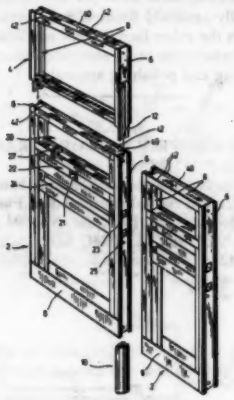
Filed Dec. 15, 1982, Ser. No. 448,401

Int. Cl.³ E04F *19/06, 19/08*

U.S. Cl. 52—221 **4 Claims**

1. In an office panelling system having a plurality of free standing panels horizontally connected to adjacent panels by hinge strips a portion of which are slidably received in said adjacent panels, at least some of said panels having a steel generally rectilinear framework which is divided horizontally in the height thereof by a horizontal member dividing said panel into separate and distinct upper and lower horizontally extending compartments, said horizontal member receiving at least one electrical receptacle which extends through said horizontal member into said lower compartment for connection to a power supply and is exposed within said upper compartment to receive electrical plugs of office equipment within said upper compartment and interior to said panel, said upper and lower compartments each having separate decorative panels removably secured to said framework to close the sides

thereof, said upper compartment being separately accessible by removing said separate upper compartment decorative panel to access said electrical receptacle for receipt of electrical plugs of office equipment in said receptacle and to store excess



electrical cord of such office equipment within said upper compartment, and means for accommodating such cord to extend between said upper compartment and the panel exterior.

4,535,578

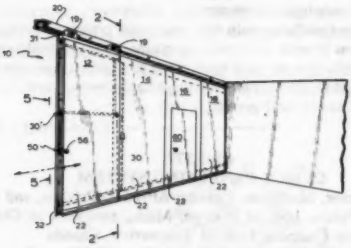
SEAL-ACTUATING MECHANISM FOR A WALL PANEL

Carl F. Gerken, New Castle, Ind., assignor to American Standard Inc., New York, N.Y.

Continuation of Ser. No. 502,862, Jun. 9, 1983, abandoned. This application Jul. 20, 1984, Ser. No. 632,923

Int. Cl.³ E04D *15/00*

U.S. Cl. 52—243.1 **30 Claims**



1. A seal-actuating mechanism, adapted to be coupled to a spring-loaded seal assembly of a wall panel, said seal assembly being shiftable vertically to and away from one side of said panel, said wall panel including a frame having a pair of opposed members, said seal-actuating mechanism comprising:

a shaft extending between said pair of opposed frame members and mounted for rotation therein;

a pair of operator members including pivot lever means mounted on said shaft and disposed in spaced relation between said opposed frame members; and

a pair of tension members disposed in said wall panel, one end of each tension member being coupled to its respective pivot lever means, and the other ends coupled to said shiftable seal assembly, said pivot lever means and said tension members cooperating with said shaft to provide releaseable latch means so that when said shaft is rotated, said seal assembly is shifted, respectively from its retracted, latched position to its extended, unlatched position.

4,535,579

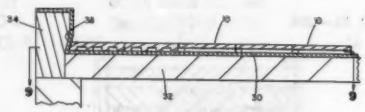
ROOF BALLAST BLOCK

John V. Burgoyne, Waltham, and Thomas E. Phalen, Jr., Winchester, both of Mass., assignors to Roofblok Limited, Fitchburg, Mass.

Filed Aug. 5, 1983, Ser. No. 520,647

Int. Cl.³ B32B *3/14*

U.S. Cl. 52—408 **4 Claims**



1. A roof ballast block having generally rectangular top and bottom faces, and two parallel edge faces bevelled at substantially identical angles of 12° to 23° from the vertical, the remaining two edge faces being parallel and substantially vertical, and having a plurality of parallel spaced channels in its bottom face,

said block being characterized by a density of 85 to 155 lb. per cu ft., a compressive strength of at least 2500 psi, a flexure tensile strength of at least 300 psi, and a capability of undergoing at least 100 freeze-thaw cycles without cracking.

4,535,580

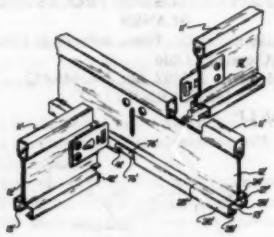
SCREW SLOT RUNNER SYSTEM

Richard Shirey, Avon, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Continuation-in-part of Ser. No. 281,829, Jul. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 267,737, May 28, 1981, abandoned. This application Jun. 3, 1983, Ser. No. 500,943

Int. Cl.³ C04B *5/52*

U.S. Cl. 52—484 **10 Claims**



1. A suspension ceiling grid system comprising elongated runners formed with a bulb at their upper edge, a planar central web, and an open channel at their lower edge, said open channel being defined by lateral flanges extending in opposite directions from the lower edge of said web, a pair of laterally spaced, substantially parallel channel sidewalls, and inturned lips extending laterally toward each other from said sidewalls and terminating at spaced and opposed inner edges, said lips cooperating to define a longitudinal opening along the lower side of said channel, said grid system including first runners having end connectors adapted to connect with second runners at predetermined locations, said second runners providing notches in their channels at said locations, said notches extending through said lips and a first portion of the associated sidewalls adjacent to said lips leaving intact a second portion of

said sidewalls and said flanges extending uninterrupted past said notch, said lips at the ends of said first runners and adjacent to the notches of said second runners being shaped to fit together to form a miter joint when said runners are interconnected, said second portions providing substantial resistance to buckling of said runners at said notches when lateral load are applied thereto.

4,535,581

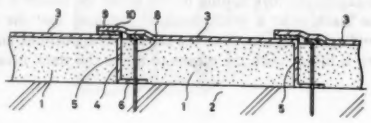
METHOD OF HEAT-INSULATING AND WATER-PROOF CONSTRUCTION UTILIZING A ROLL HAVING A WEB PORTION AND A FLAP PORTION

Toshiaki Fujiki, and Hikaru Kano, both of Hyogo, Japan, assignors to Mitsuboshi Belting Ltd., Hyogo, Japan

Continuation-in-part of Ser. No. 321,012, Nov. 13, 1981, Pat. No. 4,443,993. This application May 17, 1983, Ser. No. 495,326

Int. Cl.³ E04D *1/28*

U.S. Cl. 52—746 **7 Claims**



1. A method of constructing a heat-insulating and water-proof structure, comprising the steps of:

forming a water-proof membrane having a flat web portion and a plurality of flap portions by connecting a plurality of water-proof membrane sections together, each membrane section comprising a flat portion and a flap portion integral therewith wherein adjacent first and second membrane sections are connected by connecting a lower surface of the flat portion of the second adjacent membrane section with an upper surface of the flap portion of the first adjacent membrane section;

laying at least one first heat-insulating member on a base surface;

placing said water-proof membrane on said at least one first heat-insulating member so as to align said web portion therewith;

bending a flap portion along an edge of said first insulating member;

placing an edge of said flap portion on said base surface; and

laying a second heat-insulating member on said base surface so as to position an edge portion of said second heat-insulating member on said edge of said flap portion.

4,535,582

SKIN PACKAGING MACHINE HAVING MICROPROCESSOR-BASED CONTROL

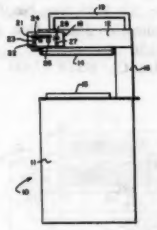
Stephen H. Jones, LaFrance, S.C., assignor to Nordson Corporation, Amherst, Ohio

Filed Nov. 12, 1982, Ser. No. 441,132

Int. Cl.³ B65B *11/52*

U.S. Cl. 53—52 **8 Claims**

1. A skin packaging machine comprising an oven, a frame adapted to receive film from a film supply, a base having a perforated surface, means for drawing a vacuum at the surface, and means for moving the frame from a position adjacent the oven to a position adjacent the perforated surface, an alphanumeric display, and a control arrangement including means for producing control signals to effect operation of functions of the skin packaging machine in accordance with parameters such as time input to the control arrangement, means for successively displaying skin packaging machine functions on the alphanumeric display, and means for entering parameter information related to functions displayed on the alphanumeric display.



4,535,583

ROTARY TYPE CAPPING APPARATUS

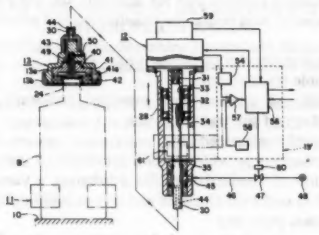
Hideo Tanaka, and Shiaru Muranaka, both of Kanazawa, Japan, assignors to Shibuya Kogyo Co., Ltd., Japan

Filed Sep. 29, 1983, Ser. No. 537,465

Claims priority, application Japan, Oct. 4, 1982, 57-174235; Oct. 4, 1982, 57-174236

Int. Cl.³ B65B *57/00*; B67B *3/26*

U.S. Cl. 53—75 **13 Claims**



1. Apparatus for capping screw caps onto the mouths of containers, comprising:

carrier means for securely and temporarily carrying said containers;

cap holding means for releasably holding said caps to cap said containers, said cap holding means being rotatably supported;

driving means for rotating said cap holding means in a predetermined direction, said driving means including a torque motor which is operatively connected to said cap holding means so as to rotate said cap holding means in said predetermined direction;

moving means for moving said cap holding means between an operative position where capping is to be carried out and an inoperative position where said cap holding means is located away from said containers carried on said carrier means; and

control means for controlling said driving means to increase the torque of said cap holding means until a predetermined level is reached while said cap holding means are capping said caps onto the mouths of said containers, said control means including first detecting means for detecting the rotating condition of said torque motor and a control circuit for controlling the torque of said cap holding means in accordance with information supplied from said first detecting means.

4,535,584

DEVICE FOR BONDING AN ARTICLE TO A COMMODITY

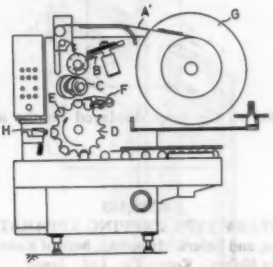
Nobutaka Tsubota, Kyoto, Japan, assignor to Tetra Pak International Aktiebolag, Alle Lund, Sweden

Filed Dec. 22, 1983, Ser. No. 565,020

Claims priority, application Japan, Dec. 24, 1982, 57-232088; Dec. 30, 1982, 57-234156

Int. Cl.³ B32B *31/00*

U.S. Cl. 53—128 **4 Claims**



1. In an adhering device of the type including a roll of long, narrow, continuous package, a means for feeding the continuous package to a cutter, a bucket wheel from picking up the commodity and transferring the commodity to an adhering position and means for transferring the cut continuous package to the adhering position and for adhering the cut package to the commodity, said means for transferring and adhering comprising:

a vacuum transfer device comprising:

a rotatable transfer drum;

a plurality of suction pipes provided uniformly about a periphery of the transfer drum;

a source of compressed air;

a void chamber provided in said drum;

a plurality of Venturi tubes for generating a vacuum provided in said void chamber and communicating each with a suction pipe; and

a pressure chamber provided in said drum to which said compressed air is supplied and which supplies compressed air to each of said Venturi tubes; and

a pusher plate which receives the cut continuous package from the vacuum transfer device and adheres it to the commodity, said pusher plate being characterized in that it is adapted to make a combined movement including a circular movement in synchronism with a movement of said bucket wheel and a movement in a direction tangential to said bucket wheel.

4,535,585

CAP REMOVAL DEVICE FOR A CELLULAR SAMPLE TREATMENT APPARATUS

Ivan Gardos, Montreal, Canada, assignor to Biomatics Inc., Montreal, Quebec, Canada

Filed Mar. 8, 1984, Ser. No. 587,660

Int. Cl.³ B65B *1/04*

U.S. Cl. 53—247 **3 Claims**

1. In an apparatus for treating samples of cellular materials wherein the samples are contained in a plurality of sample holders joined together to form a stack,

the apparatus including at least one stack holding tube, open at the top, having a removable cap,

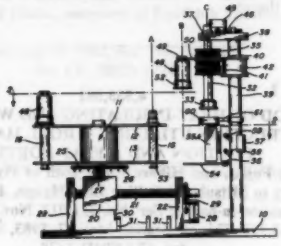
positioning means to move the stack holding tube between a treatment position and a cap removal position,

a transfer tube having a bottom opening positioned in the treatment position above the stack holding tube, and

means to move the stack from the stack holding tube to the transfer tube,

the improvement of a cap removable device comprising

a fork means attached to the means to move the stack from the stack holding tube to the transfer tube,



fork mating means on the removable cap, the fork means engaging the fork mating means when the means to move the stack is at a predetermined position, and the stack holding tube is moved to the cap removal position, and the cap is lifted when the means to move the stack is raised.

4,535,586

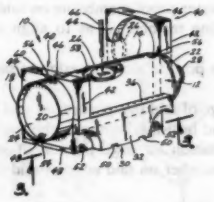
METHOD OF CONTAINING, STORING, AND TRANSPORTING AGRICULTURAL PRODUCTS IN A HIGH MOISTURE CONDITION

John W. Eberle, Cedar Bluffs, Nebr., assignor to Hawkeye Container Company, Omaha, Nebr.

Filed Oct. 27, 1980, Ser. No. 201,163

Int. Cl.³ B65B *3/04*

U.S. Cl. 53—432 **7 Claims**



1. A method of containing and storing agricultural products in a high moisture condition, comprising,

providing a generally rigid permanent reusable container having a product opening, an inlet valve and an exhaust valve,

substantially filling said container by inserting an agricultural product into said container through said product opening,

closing and sealing said product opening and container in a substantially fluid tight condition,

displacing the air from said container to the ambient atmosphere through said exhaust valve,

connecting said inlet valve to a source of a substitute gas, replacing said air with the substitute gas, and

disconnecting said inlet valve from said source of substitute gas whereby said agricultural product is independently preserved in said generally rigid container in a high moisture condition.

4,535,587

MULTI-ROLL PACKAGE OF COMPRESSIBLE MATERIALS

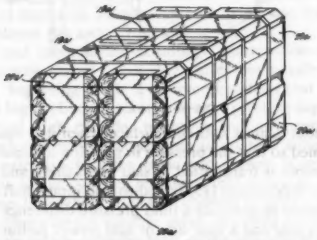
Jean-Claude Rias, Villennes-sur-Seine, France, assignor to Isover Saint-Gobain, Neuilly-sur-Seine, France

Continuation of Ser. No. 250,700, Apr. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 217,001, filed as PCT FR80/00116, Jul. 9, 1980, published as WO81/00091, Jan. 22, 1981, § 102(e) date Mar. 9, 1981, abandoned. This application Aug. 23, 1983, Ser. No. 525,796

Claims priority, application France, Jul. 9, 1979, 79 17771; Oct. 10, 1980, 80 21735

Int. Cl.³ B65B *13/20, 53/06, 63/02*

U.S. Cl. 53—436 7 Claims



1. A method for integrating a multiplicity of rolls of compressible material into a unitarily handleable multiple stack, which method comprises assembling a plurality of rolls in groups, the rolls of each group being substantially the same length and being assembled with a plurality of rolls in each of at least two layers superposed upon each other, with the axes of individual rolls of each layer overlying the axes of individual rolls of adjoining layers in common vertical planes and the rolls overlying each other being in contact with each other, assembling each multilayer group of rolls between a pair of contoured panels having grooves in which the adjoining opposite side portions of the assembly of rolls are received, establishing predetermined package dimensions in both directions transverse to the axes of the rolls by partially compressing the assembly of rolls between said contoured panels while restraining lateral spreading of the assembly of rolls between assembly forming walls having predetermined lateral dimension of the assembly, applying bindings to the assembled and partially compressed rolls of each group to form separate integrated multiple roll packages of predetermined dimensions in both directions transverse to the axes of the rolls, releasing the pressure after application of the binding, assembling a plurality of said packages in a stack with the package side surfaces in common planes at both sides of stack, and applying bindings to said stack, the stack bindings comprising shrinkable plastic sheet material, at least a portion of which bridges and is shrunk onto adjoining laterally exposed surfaces in said common planes at the sides of the stacked packages.

4,535,588

CARBON PARTICULATES CLEANING DEVICE FOR DIESEL ENGINE

Susumu Sato, Okazaki; Yukihisa Takeuchi, Aichi, and Masahiro Tomita, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 479,911, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 157,082, Jun. 6, 1980, abandoned. This application Oct. 5, 1984, Ser. No. 657,947

Claims priority, application Japan, Jun. 12, 1979, 54-74419; Jul. 11, 1979, 54-88577; Jul. 20, 1979, 54-92753; Oct. 9, 1979, 54-130545; Oct. 16, 1979, 54-133114; Jan. 22, 1980, 55-6491

Int. Cl.³ F01N *3/02*

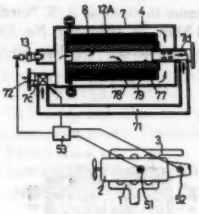
U.S. Cl. 60—286 3 Claims

2. A system for cleaning carbon particulates contained in exhaust gas discharged from an engine, comprising:

a carbon particulates cleaning device adapted to be connected to an exhaust pipe of an engine, said device including therein oxidizing catalyst and filter means for collecting carbon particulates contained in exhaust gas flowing into said device and for cleaning said exhaust gas;

a by-pass pipe for communicating an upstream end of said device with a downstream end thereof;

a valve disposed in said upstream side of said device for opening and closing said bypass pipe and correspondingly



closing and opening the upstream end of said device;

fuel supply means attached to said device at said upstream end thereof for supplying fuel thereinto;

means for detecting operational conditions of said engine; and

computer means for operating said valve and said fuel supply means in response to output signals from said detecting means.

4,535,589

EXHAUST GAS CLEANING DEVICE FOR INTERNAL COMBUSTION ENGINE

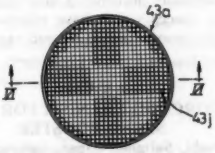
Hitoshi Yoshida, Kariya; Masahiro Tomita, and Shigeru Takagi, both of Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 381,887, May 25, 1982, abandoned. This application Jun. 13, 1984, Ser. No. 620,543

Claims priority, application Japan, May 26, 1981, 56-79841; Jun. 9, 1981, 56-88483

Int. Cl.³ F01N *3/02*

U.S. Cl. 60—303 15 Claims



1. An exhaust gas cleaning device for collecting particulates in exhaust gases of an internal combustion engine and burning the collected particulates, comprising:

a filter member which is disposed in an exhaust gas passage of said internal combustion engine for collecting the particulates in the exhaust gases,

said filter member being formed of ceramic and provided with a large number of interconnected passages for passing the exhaust gases therethrough;

an electrical heating means composed of a ceramic base body having at least one heating element which is partially and integrally formed in said base body, said heating element being arranged about the axis of said ceramic base body uniformly;

said ceramic base body being provided with opposed end surfaces and a large number of passages for passing the exhaust gases therethrough and one of said opposed end

surfaces of said base body being closely adhered to an exhaust gas inlet end surface of said filter member; and

an electric power supplying means for electrically connecting said heating element to an electric power source.

4,535,590

THERMAL SERVO-MOTOR, PARTICULARLY FOR VALVES

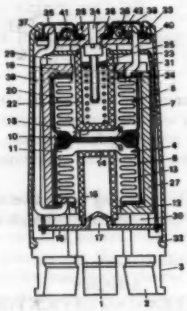
Finn Jacobsen, Nordborg; Jens J. Molbaek, Lavensby; Jan Zangenberg, Nordborg, and Poul S. Dam, Ketting, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Mar. 29, 1984, Ser. No. 594,977

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 3313999

Int. Cl.³ F03C *5/00*

U.S. Cl. 60—531 **15 Claims**



1. A thermal valve actuating servomotor, comprising, casing means, valve actuating means, first and second operating elements forming expansible chambers, each said element having fixed and moveable parts with said fixed parts being connected to said casing means and said moveable parts being connected to said valve actuating means, first and second container means attached to said casing means and first and second fluid conduit means connecting said container means respectively to said expansible chambers, a temperature dependent vapour filling in each of said casing means and said chambers, first and second heating means respectively for said container means for respectively thermally influencing said fillings, said container means forming spaces which have relatively small volumes compared to the spaces formed by said expansible chambers.

4,535,591

REACTION FORCE MECHANISM FOR BRAKE POWER SERVO BOOSTER

Michio Kobayashi, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Japan

Filed Sep. 27, 1983, Ser. No. 536,094

Claims priority, application Japan, Sep. 27, 1982, 57-167850; Sep. 30, 1982, 57-172402

Int. Cl.³ B60T *13/20*; F15B *9/10*

U.S. Cl. 60—554 **18 Claims**

1. A reaction force mechanism for a brake power booster, comprising:

a power piston (**4**) slidably disposed in a shell (**1**);

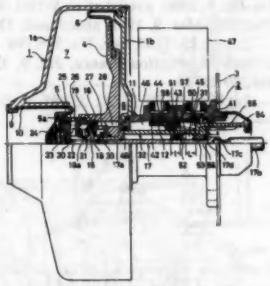
a master cylinder (**2**) connected to said shell on a brake pedal side;

an output shaft (**32**) for linking said power piston with a second piston (**31**) of said master cylinder;

an elastic member (**53**) situated between said output shaft (**32**) and an input shaft (**17**), and forming a boundary of a first hydraulic pressure reaction force chamber (**50**) and capable of being elastically deformed upon reception of pressure in said first hydraulic pressure chamber;

a passage (**57**) for providing communication between said first hydraulic pressure chamber and a second pressure chamber (**45**) of said master cylinder;

said input shaft (**17**) having an end surface (**17*d***) disposed in opposition to said elastic member with a predetermined distance (δ) therebetween, said elastic member being made



to abut against said end surface when it is elastically deformed so that the pressure in said first hydraulic pressure chamber is transmitted to said input shaft; and

a valve mechanism (**15**) linked to said input shaft so as to be actuated to generate a fluid pressure difference between a front side and a rear side of said power piston.

4,535,592

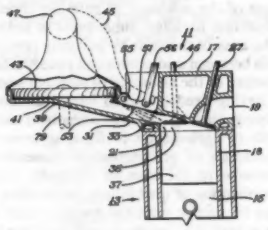
INTERNAL COMBUSTION ENGINE HAVING AN EXHAUST GAS TURBINE

Herbert G. Zinsmeyer, Austin, Tex., assignor to Specialty Systems, Inc., Austin, Tex.

Filed Apr. 12, 1983, Ser. No. 484,208

Int. Cl.³ F02B *41/10*

U.S. Cl. 60—597 **4 Claims**



1. In combination with an internal combustion engine having at least one cylinder carrying a respective reciprocally movable piston, a respective cylinder head closure on said at least one cylinder and closing the end of the respective said cylinder to define a respective combustion chamber with respect to said cylinder piston, inlet manifold means connected with said cylinder for conveying at least an oxygen-containing gas thereto, means for admixing incoming fuel with the oxygen-containing gas, ignition means for firing the fuel in the oxygen-containing gas, to develop power, and exhaust port for the periodic discharging of hot, high pressure combustion products from said cylinder, said exhaust port being disposed in a respective boundary wall of the combustion chamber or cylinder; the improvement comprising:

(a) at least one respective nozzle means adapted for accelerating and conveying the hot, high pressure combustion products from the respective said cylinder to a turbine, said nozzle means having inlet and discharge ends and having its said inlet end contiguous said boundary wall at said exhaust port and sealingly encompassing said exhaust

port so as to prevent leakage of said hot, high pressure combustion products to the atmosphere;

(b) a valve means;

(c) means coupled to said valve means for controlling said valve means to allow cylinder combustion gases to flow through the nozzle means near the end of the expansion (power) stroke of the piston; and

(d) at least one turbine having respective inlet and discharge passageways and an output shaft for delivering power and disposed closely adjacent the nozzle means and having its inlet passageway connected with said discharge end of said nozzle means and sealingly connected therewith so as to prevent leakage of said expanded, high velocity combustion products to the atmosphere and constraining said expanded, high velocity combustion products to pass through said turbine, thereby giving up their energy to said turbine to become low pressure, low velocity exhaust gas, said discharge passageway conveying said low pressure exhaust gas away from said turbine;

said nozzle and valve means including a combination variable geometry nozzle throat valve that varies the nozzle during blowdown beginning with a convergent-divergent nozzle structure at high cylinder pressures so as to produce supersonic flow at initial high cylinder pressures and progresses with smaller discharge end-to-throat area ratios to a simple converging nozzle structure for sonic and slower flows at the succeedingly lower cylinder pressures, that provides variable nozzle shapes throughout the valve opening sequence and that eliminates otherwise irreversible valve throttling losses ahead of said nozzle means, thereby maximizing the nozzle exit gas velocity and energy recovery by the turbine whereby said output shaft of said turbine can deliver power efficiently removed by said variable geometry nozzle valve and said turbine from said hot, high pressure cylinder combustion gases.

4,535,593

METHOD OF AND APPARATUS FOR WARMING HIGH-PRESSURE FEED WATER HEATERS FOR POWER PLANTS

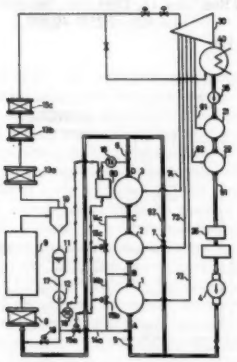
Kenji Sakka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,601

Claims priority, application Japan, Aug. 28, 1981, 56-133966

Int. Cl.³ F01K *13/02*

U.S. Cl. 60—646 **11 Claims**



1. A method of warming high-pressure feed water heaters for power plants provided with a boiler having a boiler circulation system adapted to return hot water separated by a gas water separator provided in an outlet of a boiler water wall to an inlet side thereof, the method comprising the steps of introducing part of the high temperature water which has circulated in the boiler circulation system into a feedwater system on an inlet side of the high-pressure feed water heater through a warming pipe branching from the boiler circulation system, during a period of time between an ignition of the boiler and a coming into service of said high pressure feed water heater, returning the circulating feed water which has passed through said high pressure feed water heater to said boiler, and controlling the flow rate of said high temperature water flowing through said warming pipe in accordance with the temperature of the feed water at the outlet side of said high pressure feed water heater.

4,535,594

METHOD AND APPARATUS FOR GENERATING POWER AND LOW PRESSURE SATURATED OR NEAR SATURATED STEAM

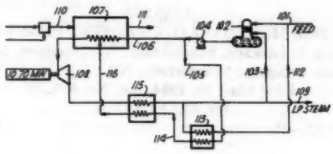
Rodney J. Allam, Guildford, and Alan L. Prentice, Surbiton, both of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 19, 1984, Ser. No. 601,882

Claims priority, application European Pat. Off., Apr. 19, 1983, 83302191.8

Int. Cl.³ F01K *7/38, 19/10*

U.S. Cl. 60—654 **13 Claims**



1. A method for generating power and low pressure saturated or near saturated steam, which method comprises the steps of:

(a) heating feed water in a boiler to produce superheated steam; and

(b) expanding said superheated steam through a turbine to provide mechanical and/or electrical power and low pressure steam;

characterized in that said method includes the steps of:

(c) using at least part of said low pressure steam to heat a major part of said feed water to a temperature higher than the remainder of said feed water; and

(d) introducing the thus heated part of said feed water and the remainder of said feed water into said boiler at different temperature zones therein.

4,535,595

COOLING DEVICE FOR A LOW TEMPERATURE MAGNET SYSTEM

Tony W. Keller, Rheinstetten, and Wolfgang Müller, Karlsruhe, both of Fed. Rep. of Germany, assignors to Bruker Analytische MeBtechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Feb. 7, 1984, Ser. No. 577,699

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304375; Mar. 8, 1983, 3308157

Int. Cl.³ F25B *21/02*

U.S. Cl. 62—3 **37 Claims**

1. A cooling apparatus for a superconducting magnet, comprising:

a magnet coil encircling a test space;

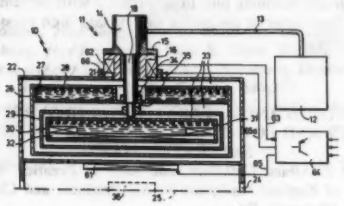
an evacuated outer shell surrounding said magnet coil;

an intermediate shield arranged between said magnet coil and said outer shell;

a refrigerator with moving parts mounted on the outside of said outer shell, said refrigerator having a cooling arm

extending through said outer shell and being in thermally conductive connection with said intermediate shield;

sensing means for picking up magnetic and/or mechanical signals generated by said moving parts of said refrigerator during operation and for producing output signals related to said picked up magnetic and/or mechanical signals; and



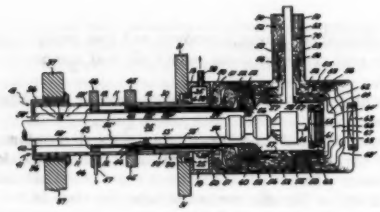
at least one additional coil to which said output signals of said sensing means are fed for compensating magnetic fields generated within said test space by said moving parts of said refrigerator.

4,535,596

PLUG FOR HORIZONTAL CRYOSTAT PENETRATION

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,200
Int. Cl.³ F17C *1/00*
U.S. Cl. 62—45 **16 Claims**



1. A plug for a horizontal penetration of a cryostat having an inner wall and an outer wall, said plug comprising:

an outermost, low thermal conductivity housing;

an inner, low thermal conductivity housing disposed within said outermost housing;

at least one intermediate high thermal conductivity housing disposed between said inner housing and said outermost housing;

thermal insulation disposed between said inner housing and said at least one intermediate housing;

thermal insulation disposed between said outermost housing and said at least one intermediate housing;

said inner housing including an inner tubular extension for insertion into said cryostat penetration, said inner extension having first heat station means for fixing the temperature of at least a portion of said inner extension;

said at least one intermediate housing including an intermediate tubular extension for insertion into said cryostat penetration, said intermediate extension having second heat station means for fixing the temperature of at least a portion of said intermediate extension;

said outermost housing including an outermost tubular extension for insertion into said cryostat penetration, said outermost extension being sealably attached to said inner tubular extension so that the volume defined by said outermost housing and said inner housing is evacuable;

said inner housing having pressure relief means disposed therein; and

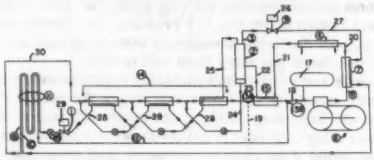
said outermost housing having pressure relief means disposed therein.

4,535,597

FAST CYCLE WATER VAPOR CRYOPUMP

Dale J. Missimer, San Anselmo, and Michael R. St. Pierre, Petaluma, both of Calif., assignors to Marin Tek, Inc., San Rafael, Calif.

Filed Jan. 25, 1984, Ser. No. 573,679
Int. Cl.³ B01D *8/00*
U.S. Cl. 62—55.5 **6 Claims**



1. A system for controlling the temperature of a cryosurface wherein the cryosurface is provided with both a defrost tube and an evaporator tube respectively thermally coupled thereto,

a source of compressed refrigerant,

heater means,

means for directing flow of said refrigerant from said source to said heater means to raise the temperature of the refrigerant,

cooling means,

means for directing flow of said refrigerant to said cooling means to cool the refrigerant, and

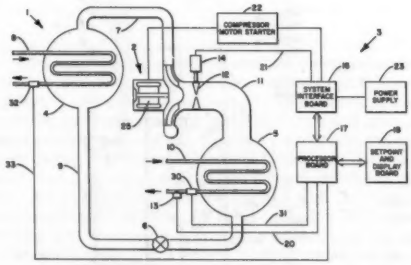
valve means for selectively controlling the flow of said raised temperature refrigerant into the defrost tube and the cooled refrigerant into the evaporator tube.

4,535,598

METHOD AND CONTROL SYSTEM FOR VERIFYING SENSOR OPERATION IN A REFRIGERATION SYSTEM

Gordon L. Mount, West Monroe, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 14, 1984, Ser. No. 610,058
Int. Cl.³ F25B *49/00*
U.S. Cl. 62—126 **9 Claims**



1. A safety control system for sensors in a refrigeration system including a compressor, a condenser, and an evaporator, comprising:

a sensor means for sensing an operating condition and for generating a signal in response to the operating condition, said sensor means having a first prescribed operating range prior to startup wherein any signal generated out-

side said first prescribed range indicates a malfunction of said sensor means and a second prescribed operating range during system operation wherein any preselected number of consecutive signals generated outside said second prescribed range indicates a malfunction of said sensor means,

processor means connected to said sensor means for monitoring generated signals from said sensor means and for determining whether the signals are within respective said first and said second prescribed operating ranges,

said processor means further generating a first alarm signal when a monitored signal falls outside said first prescribed operating range prior to startup, and generating a second alarm signal when any monitored preselected number of consecutive signals falls outside said second prescribed operating range during system operation, and

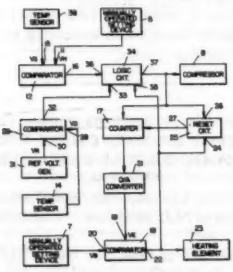
safety means connected to said processor means for receiving said first and said second alarm signals, for aborting startup upon receiving said first alarm signal, and for shutting down said system upon receiving said second alarm signal, whereby shutdowns of said refrigeration system due to malfunctioning sensors is eliminated.

4,535,599

CONTROL DEVICE FOR REFRIGERATING EQUIPMENT

Duilio Besson; Claudio De Marco; Roberto Peruzzo, all of Pordenone, and Giuseppe Ardit, Venice, all of Italy, assignors to Industrie Zanussi S.p.A., Pordenone, Italy

Filed Nov. 18, 1982, Ser. No. 442,777
Claims priority, application Italy, Feb. 5, 1982, 45704 A/82
Int. Cl.³ F25D *21/06*
U.S. Cl. 62—154 **5 Claims**



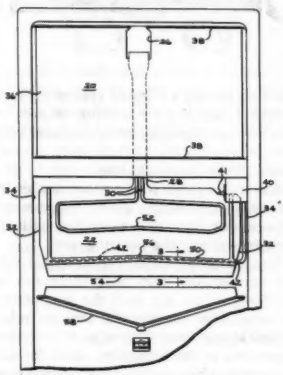
1. A control device for refrigerating equipment having at least one compressor and one defrostable evaporator placed in a space to be refrigerated, said device comprising: first and second manual setting means for generating respective output voltage corresponding to the temperature to be selected for said space and to the number of work cycles corresponding to the humidity level to be obtained in said space, said second manual setting means controlling the number of on-off work cycles to be performed by said means compressor between defrost operations; first and second sensor means for respectively detecting the temperatures of said space and of said evaporator and for generating corresponding output voltages, which respectively control the on-off work cycles of the said compressor according to the space temperature and to the evaporator temperature; a first electronic control means for controlling the on-off work cycles of said compressor depending on the output voltages generated respectively by said first manual setting means, according to the temperature to be obtained in said space and by said first sensor means, according to the temperature detected in said space; a second electronic control means for controlling the on-off work cycles of said compressor between defrost operations, depending on the output voltages generated by said second manual setting means, according to the selected number of on-off work cycles to be performed by said compressor and by a counter means which counts the number of on-off work cycles performed by said compressor, said second electronic control means stopping said compressor when the number of on-off work cycles counted by said counter means is equal to the number selected by said second manual setting means; a heating means for heating said evaporator and defrosting it, said heating means being controlled by said second electronic control means so as to be switched off when said compressor is operating and switched on when said compressor is stopped; and a third electronic control means for controlling the re-start of said compressor depending on the output voltages which are respectively generated by said second sensor means and by at least one reference voltage generator having a fixed reference voltage corresponding to the end of the evaporator defrosting, said third electronic control means determining the re-start of said compressor when said evaporator has been heated by said heating means at a temperature corresponding to the end of its defrosting.

4,535,600

TEMPERATURE CONTROL FOR A CYCLE DEFROST REFRIGERATOR INCORPORATING A ROLL-BONDED EVAPORATOR

Robert B. Gelbard, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 16, 1984, Ser. No. 600,986
Int. Cl.³ F25D *21/06*
U.S. Cl. 62—156 **8 Claims**



1. A cycle defrost household refrigerator including a cabinet having an upper lower temperature food compartment and a lower relatively high temperature food compartment, evaporator means for refrigerating said compartments comprising:

a first evaporator located in said low temperature compartment and a second evaporator arranged substantially vertically in said relatively high temperature compartment and connected to said first evaporator in series refrigerant flow relationship;

means for supplying liquid refrigerant to said liquid carrying conduits in said first and second sections in series and for withdrawing evaporated refrigerant therefrom;

a temperature control means in said high temperature food compartment including a temperature sensitive capillary tube portion having a length corresponding substantially to the width of said second evaporator;

said temperature control being operable by the coldest temperature sensed along the length of said capillary for causing said compressor to cycle off to cause defrosting of said section of said evaporator;

a passageway positioned in heat exchange relationship to

said second evaporator extending substantially the entire width between the vertical sides thereof;

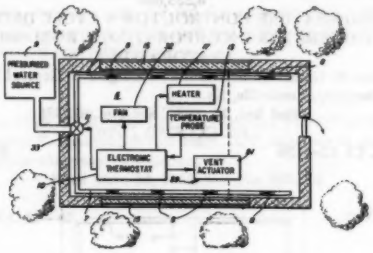
said passageway having a cross-sectional dimension for allowing insertion of said capillary tube portion to a position substantially the full length of said passageway and for insuring thermal relationship between said capillary tube portion and said passageway so that said capillary tube portion is subjected to the limited environment of said passageway and the temperature of said second section.

4,535,601

ENVIRONMENTAL CONTROL SYSTEM

Alfred T. Newell, Jr., and Alfred T. Newell, III, both of Birmingham, Ala., assignors to A. T. Newell Co. Inc., Birmingham, Ala.

Filed Feb. 28, 1984, Ser. No. 584,387
Int. Cl.³ F28D *3/00*
U.S. Cl. 62—171 **28 Claims**



1. In a building having a fogging system for spraying atomized water into a building for cooling animals and or birds contained therein, an improved environmental control system, comprising:

an electronic thermostat including

means for sensing the temperature within the building including a probe with a sensor and means for protecting the sensor from direct contact with the atomized water sprayed into the building, and

means for generating an actuation signal when a preselected temperature associated therewith is sensed by said sensing means and until the temperature is altered by a preselected incremental amount relative to said first preselected temperature; and

means responsive to the actuation signal for actuating said fogging system while said actuation signal is being generated and for deactuating the fogging system when said actuation signal is terminated.

4,535,602

SHIFT LOGIC CONTROL APPARATUS FOR UNEQUAL CAPACITY COMPRESSORS IN A REFRIGERATION SYSTEM

Richard H. Alsenz, 4730 Creek Meadow, Missouri City, Tex. 77459, and Roger C. Ansted, Houston, Tex., assignors to Richard H. Alsenz, Missouri City, Tex.

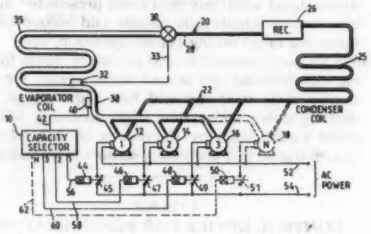
Filed Oct. 12, 1983, Ser. No. 541,278
Int. Cl.³ F25B *7/00*
U.S. Cl. 62—175 **6 Claims**

1. In combination with apparatus for matching the capacity of a cooling system to a cooling load, comprising

a number of commonly piped compressors, at least some of which are not of equal capacity, controllably energized and deenergized by a plurality of actuation means and having a common suction pressure load, each said compressor selectably energized and deenergized independently of the energization state of any other of said compressors to enable more than one said compressor to be selected at a time for change in state energization, and where each combination of energized and deenergized compressors defines a capacity stage;

measurement means for generating an increase capacity signal when said suction pressure exceeds a first preselected value and a decrease capacity signal when said suction pressure falls below a second predetermined value; and

selection means for selecting at least one said compressor to be energized or deenergized in response to and at a delayed time following said increase capacity signal or a decrease capacity signal so as to match capacity to the cooling load,



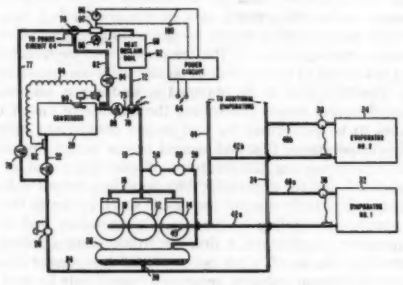
the improvement in said selection means comprising a logic means for selecting no more than two of said compressors at a time for change in state energization, said selection means minimizing cycling of said compressors when matching capacity to the cooling load by skipping over those capacity stages which would require more than two of said compressors to change energization states when increasing or decreasing the capacity of the cooling system.

4,535,603

HIGHLY ENERGY EFFICIENT HEAT RECLAMATION MEANS FOR FOOD DISPLAY CASE REFRIGERATION SYSTEMS

Benjamin R. Willitts, Lawrenceville, and Charles W. Klossman, Burlington, both of N.J., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Jul. 2, 1984, Ser. No. 627,137
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—196.4 **22 Claims**



1. In a refrigerating system including at least one compressor in which refrigerant is compressed into the form of a hot gas, a condenser, hot gas discharge line means extending from the compressor to the condenser, at least one evaporator, a liquid line extending from the condenser to the evaporators, and

suction line means extending from the evaporator to the compressor, the improvement comprising:

(a) a heat reclaim coil;

(b) means for, at times, diverting the flow of hot gas from the discharge line means to the coil for heat-exchange with the surrounding ambient and at least a partial condensation of the refrigerant within the coil; and

(c) means for bypassing the outflow of refrigerant from the coil around the condenser to the liquid line whenever said refrigerant has been condensed fully to a liquid form within the coil and for, alternatively, directing said outflow to the condenser for further condensation whenever the refrigerant exits the coil as a mixture of gas and liquid.

4,535,604

MACHINE FOR MAKING ICE CREAM AND SIMILAR COLD PRODUCTS, HAVING A REMOVABLE ICE CREAM-MAKING VESSEL

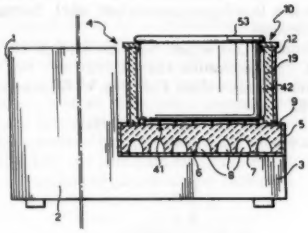
Alfredo Cavalli, 9, Via Galileo Galilei, Pessano Con Bornago (Milan), Italy

Filed May 16, 1984, Ser. No. 610,766

Claims priority, application Italy, May 19, 1983, 21185 A/83

Int. Cl.³ A23G 9/00

U.S. Cl. 62—342 **4 Claims**



1. A machine for making ice cream and similar cold products comprising a removable ice cream making vessel, a support structure with a base housing, and a substantially cylindrical cooling chamber mounted on said base housing for receiving said removable ice cream making vessel, said cooling chamber having a side wall, at least said side wall of said cooling chamber having a circular cross-section which is incompletely closed on itself whereby it defines a slot extending along a generatrix, said side wall including an outer substantially cylindrical resiliently deformable layer, a stratum of elastically yielding material fixed inside said layer, ducts for circulating refrigerant fluid fixed within said stratum, and means for enlarging said cooling chamber by widening said slot against the resilient reaction of said outer layer, said cooling chamber being mounted on said base housing by means of a first vertical pin located in correspondence with said slot and a second vertical pin in a position diametrically opposite said first pin.

4,535,605

APPARATUS FOR EXTRACTION OF ARTICLES FROZEN IN MOULDS IN A FREEZING MACHINE

Klaus Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark

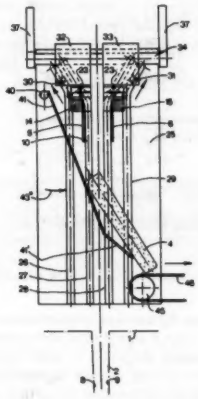
Filed Apr. 9, 1984, Ser. No. 598,057

Claims priority, application Denmark, Apr. 14, 1983, 1640/83

Int. Cl.³ A23G 9/00

U.S. Cl. 62—345 **5 Claims**

4. An apparatus for extraction of articles frozen in rows of moulds in a freezing machine, said apparatus comprising means for inserting retaining means in the moulds for engagement with said articles and means for lifting said retaining means for extraction of the articles, wherein the retaining means for a row of moulds comprise two rows of plate sections designed for insertion along the inner surfaces of two oppositing outer side walls of the moulds of the row of moulds concerned, the lower edges of the plate sections of one of said rows of plate sections including a retaining flange facing the opposing plate sections of the other of said rows of plate sections, said apparatus, moreover, comprising a chute pivotal about an axis extending in substantially parallel relationship to the longitudinal direction of said rows of plate sections in the extraction position and being, as seen in the vertical direction, offset laterally in relation to that of the rows of plate sections provided with retaining flanges, actuating means being provided for moving



said chute from a first position in which it, as seen in the vertical direction, extends laterally of the two rows of plate sections concerned and to a second position in which it extends inclined with the lower end of said chute positioned below the rows of plate sections concerned in their lifted position and wherein the upper ends of the plate sections of each of said rows of plate sections are secured to a bar, both ends of said bars being provided with means for engagement with guide means provided in said apparatus, said guide means being adapted for guiding said bars so that they are first travelling in parallel relationship and then separated from each other.

4,535,606

HIGH EFFICIENCY AIR CYCLE AIR CONDITIONING SYSTEM

George C. Rannenberg, Canton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1983, Ser. No. 560,007

Int. Cl.³ F25D 9/00

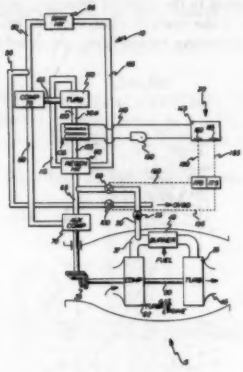
U.S. Cl. 62—402 **22 Claims**

1. In an air cycle refrigeration system for providing chilled refrigerant air to a load for the cooling thereof, said system being adapted for the supply thereto of compressed charge air from the compressor discharge section of a gas turbine engine and comprising a bootstrap compressor for increasing the pressure of said refrigerant air, airflow exhausted from said refrigerant compressor being directed to an expansion turbine for cooling thereby and discharge therefrom to said load, said expansion turbine and bootstrap compressor being mechanically interconnected whereby said expansion turbine provides, a measure of input power for driving said bootstrap compressor, said air cycle refrigeration system being characterized by:

means for exhausting substantially the entire airflow from said load to an inlet of said bootstrap compressor whereby said bootstrap compressor, said expansion turbine and said load define a closed-loop circulatory system;

a first conduit connecting said compressor discharge section of said gas turbine engine with said closed-loop circula-

tory system between said expansion turbine discharge and said bootstrap compressor inlet for providing said charge air to said refrigeration system whereby the system air pressure may be maintained at least at substantially the same level as the gas turbine engine compressor discharge pressure;



means for sensing the cooling requirements of said load and providing an output signal indicative thereof; and

a first control means disposed in said refrigeration system and responsive to the output signal from said sensing means for controlling the flow of air through said refrigeration system, thereby controlling the capacity thereof in response to the cooling requirements of said load.

4,535,607

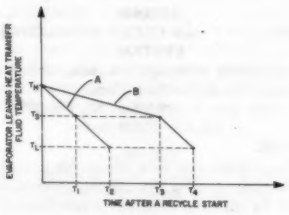
METHOD AND CONTROL SYSTEM FOR LIMITING THE LOAD PLACED ON A REFRIGERATION SYSTEM UPON A RECYCLE START

Gordon L. Mount, West Monroe, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 14, 1984, Ser. No. 610,061

Int. Cl.[3] **F25D** *17/02*

U.S. Cl. 62—201 **7 Claims**



1. In a method of operating a vapor compression refrigeration system including a compressor which is part of the refrigeration system, including the steps of

monitoring a load to be satisfied by operation of the refrigeration system;

turning on the refrigeration system, including the refrigeration system compressor, when the step of monitoring detects a load to be satisfied by operation of the refrigeration system;

adjusting the capacity of the refrigeration system to match the load on the refrigeration system when the refrigeration system is turned on to satisfy the load detected by the step of monitoring;

turning off the refrigeration system compressor when, to match a low load, the refrigeration system is adjusted to its minimum capacity level by the step of adjusting and the refrigeration system is providing excess capacity for satisfying this low load even though the refrigeration system is operating at its minimum capacity level;

a recycle start method for gradually increasing refrigeration system capacity, comprising the steps of:

turning the refrigeration system compressor back on when the step of monitoring detects a new and relatively small increased load to be satisfied by operation of the refrigeration system after the refrigeration system compressor has been turned off due to excess capacity;

controlling the refrigeration system to meet a pseudo load which is initially less than the new load and which is relatively gradually increased to equal the actual load on the refrigeration system; and

repeating the step of adjusting after the pseudo load is increased by the step of controlling to equal the actual load on the refrigeration system.

4,535,608

CIRCULAR KNITTING MACHINE FOR PRODUCING ONE-FACE PLUSH WEBS

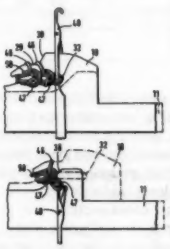
Ernst-Dieter Plath, Albstadt, and Dieter Klinger, Oberndorf, both of Fed. Rep. of Germany, assignors to Sipra Patententwicklungs-und Beteiligungsgesellschaft mbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 303,712, Sep. 18, 1981, abandoned. This application Jan. 20, 1984, Ser. No. 572,923

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035582

Int. Cl.[3] **D04B** *9/12, 15/24*

U.S. Cl. 66—9 R **7 Claims**



1. A circular knitting machine for producing one-face plush webs from main threads and plush threads, the machine comprising a plurality of movable needles; a plate ring including a plurality of plate members cooperating with said needles for producing a mesh from said threads; and a plurality of cam members for controlling a longitudinal movement of said needles and for controlling a movement of said plate members radially towards and away of said needles, said needles and said plate members being arranged so that each of said needles cooperates with two adjacently positioned, parallel plate members to produce and tighten plush loops to form a mesh, one of said two plate members having a slot for receiving a main thread and a stepped back portion for supporting a plush thread, whereas the other of said two plate members has a thread placing edge adapted to limit the effective length of said slot of said one plate member, said cam members being adapted to control said two plate members separately and independently from each other and being arranged so that a relative movement between said two plate members results

(a) for tightening a plush loop (**46**) when the associated needle (**40**) is in a raised position,

(b) for positioning main and plush threads when the needle is moved to a loop sinking position, and

(c) for tightening a mesh (**47**) produced from plush and main

threads when the needle is in the loop sinking position and is beginning to be raised.

4,535,609

YARN TENSION DEVICE FOR A FLAT KNITTING MACHINE

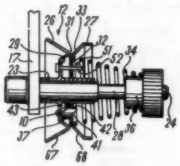
Ernst Goller, Reutlingen, and Fritz Walker, Kusterdingen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Company, Fed. Rep. of Germany

Filed Mar. 13, 1984, Ser. No. 589,248

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310132

Int. Cl.³ D04B *15/44*

U.S. Cl. 66—146 **24 Claims**



1. A yarn tension device for a flat knitting machine, comprising a yarn brake having first and second juxtaposed brake plates, said brake plates being adapted to receive a yarn therebetween, biassing means urging at least one of the brake plates towards the other brake plate, and a securing device which defines a yarn path between said brake plates, said securing device being capable of being opened to permit the yarn to be open-threaded into said yarn path but being operative thereafter to close automatically access to said yarn path.

4,535,610

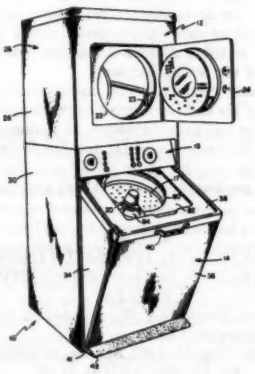
APPARATUS AND CONTROL FOR TILT-OUT WASHER

Robert M. Fey, Rocky Face, Ga.; Harold L. Woehler, and Philip J. Manthei, both of Ripon, Wis., assignors to Speed Queen Company, Ripon, Wis.

Filed May 31, 1984, Ser. No. 615,973

Int. Cl.³ D06F *39/00*

U.S. Cl. 68—3 R **13 Claims**



1. A top loading clothes washer rotatable about a horizontal axis to a forward tilt-out position from under a stationary structure, comprising:

a stable base comprising means for pivotally supporting said washer about said horizontal axis wherein said washer is rotatable between an upright position used for washing and said tilt-out position used for loading and unloading clothes; and

means responsive to water in said washer being above a predetermined level for locking said washer in said upright position thereby preventing forward rotation of said washer toward said tilt-out position.

4,535,611

TREATING TEXTILE MATERIAL WITH NON WOVEN FABRIC ROLLS

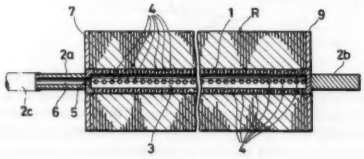
Masao Masuda, Toyoake, Japan, assignor to Kabushiki Kaisha Masuda Seisakusho, Aichi, Japan

Filed Sep. 15, 1983, Ser. No. 532,566

Claims priority, application Japan, Sep. 17, 1982, 57-162697; Jan. 17, 1983, 58-6184

Int. Cl.³ D06B *1/16*

U.S. Cl. 68—202 **10 Claims**



1. A combination of nonwoven fabric rolls for use in carrying out a method of treating textile material, comprising

at least one fluid supply roll which includes a first cylindrical core extending coaxially of said fluid supply roll, a number of first nonwoven fabric elements mounted on said first cylindrical core in tight contact relation to one another, and first fluid passageways which are formed internally of said fluid supply roll for intercommunicating connection through first conduit means to an external forcible fluid supply source and which are open to said first nonwoven fabric elements for forcibly letting treatment fluid flow out of the circumferential periphery of said fluid supply roll,

at least one suction roll opposed in cooperative relationship with said fluid supply roll, and

said suction roll including a second cylindrical core extending coaxially of said suction roll, a number of second nonwoven fabric elements mounted on said second cylindrical core in tight contact relation to one another, and second fluid passageways which are formed internally of said suction roll for intercommunicating connection through second conduit means to an external negative pressure source and which are open to said second nonwoven fabric elements for forcibly sucking said treatment fluid flowing out of said circumferential periphery of said fluid supply roll.

4,535,612

PADLOCK SHIELD

Louis J. Seremet, Rural Box 44, Brookfield, Mass. 01506

Filed Apr. 8, 1983, Ser. No. 483,245

Int. Cl.³ E05B *67/38*

U.S. Cl. 70—56 **11 Claims**

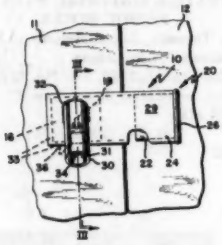
1. Lock assembly for securing first and second closure members, comprising:

(a) a staple secured to one of said closure members and having a padlock receiving loop,

(b) a hasp having a back plate secured to the other of said closure members, and a front plate hingedly connected to the back plate for movement from an open position in which the front plate is clear of said one closure member to a closed position in which the front plate overlies said loop, said front plate having a slot for receiving the loop

of said staple so that loop extends forwardly of the outwardly facing surface of the front plate when the front plate is in said closed position,

(c) a padlock having a body portion, a shackle at one end of the body portion, and a keyhole at the other end of the body portion, said shackle being adapted to extend through the loop portion of said staple to secure the front plate of said hasp in said closed position, and



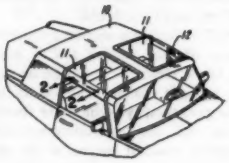
(d) a tubular shield having an inner end which is fixed to said outwardly facing surface and which completely circumscribes said slot, said shield having an outer end which has an opening that is large enough to permit the insertion of a human hand, said tubular shield defining a cavity having a central longitudinal axis which extends at a substantial angle to the plane of said outwardly facing surface, said tubular shield being sufficiently long so that an adult human hand must be inserted beyond the wrist joint in order to reach the padlock.

4,535,613

T-TOP LOCK-HANDLE

Frank J. Mastromatteo, 6150 Ironside Dr., Centerville, Ohio 45459

Filed Aug. 19, 1982, Ser. No. 409,627
Int. Cl.³ E05B *13/10*
U.S. Cl. 70—221 **7 Claims**



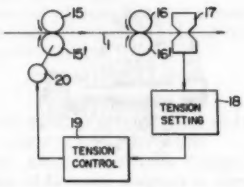
1. A "T-top" lock-handle combination wherein both the key and locking mechanisms operate in three positions but the handle operates in two positions comprising a latch stud adapter mechanism including a friction washer permitting its handle-housing to rotate to a false open (false unlocked) position and including an adapter having an internal configuration which mates with the external configuration of a latch stud mounted in a vehicle roof; notches or surfaces and means to secure said adapter to said latch stud on one end; means to secure another end of said adapter mechanism to one portion of a lock handle-housing which encase locking, locking cam and adapter mechanisms, and wherein said locking mechanism and locking cam operate over an arc from locked to unlocked ranging from about 60° to about 180° whereas said handle housing operates over an arc of about 90° in two positions; said locking mechanism being located within said lock-handle housing and including a locking cam having notches or surfaces responsive in movement to key-operated alignment means to position the locking cam in response to three key positions such that operation of the key from locked to false unlocked (handle pivot but locked) to unlocked positions causes the locking cam notches or surfaces to engage mating notches or surfaces of said adapter to drive same to permit removal of said "T-top" upon rotation of the handle housing to unlocked position.

4,535,614

METHOD OF GAUGING AND CONTROLLING WORKPIECE PROFILE IN A ROLLING MILL

Toshihiro Oka, Muroran, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,392
Int. Cl.³ B21B *37/02*
U.S. Cl. 72—16 **8 Claims**



1. A method of gauging the diameter of a moving bar or like workpiece in a rolling mill, comprising the steps of:

disposing about said workpiece at a gauging station gauging means for continuously gauging diameters at n equally spaced angular positions on the periphery of said workpiece while said gauging means is continuously rotating around the moving workpiece with its axis of rotation registered with the pass line of the rolling mill;

computing and displaying for said workpiece a roll-free diameter Df, and a maximum diameter Dx and a minimum diameter Dn other than said roll-free diameter Df, on the basis of the diameter values gauged by said workpiece gauging means for at least half of the periphery of said workpiece and on the basis of assigning as Df the gauged diameter corresponding to the largest value of Y computed in accordance with the regression curve $Y = A \sin \phi$ where Y is a calculated deviation from a desired diameter of the workpiece, A is a constant representing the maximum deviation when $\phi = 90°$ and ϕ is the angle of the position of the deviation Y taken from a zero value position selected so that the regression curve best approximates the actual measured deviations from the desired diameter of the workpiece; and

computing and displaying the corresponding peripheral positions of Dx and Dn relative to the peripheral position of said Df at said gauging station, said computation of the diameters and positions of Dx and Dn excluding gauged values in the angular range of 30° to either side of the peripheral position of said Df at said gauging station.

4,535,615

PROCESS AND APPARATUS USING ULTRA-FILTRATION IN THE PRODUCTION OF CAN SHELLS

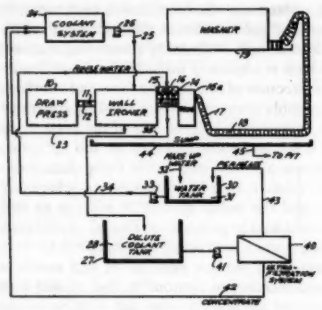
Gerald J. Ebben, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Dec. 30, 1982, Ser. No. 454,576
Int. Cl.³ B21D *22/20, 51/26*
U.S. Cl. 72—39 **6 Claims**

1. In the process of producing drawn and ironed can shells from sheet metal by drawing cup-shaped cups from the sheet metal, elongating the sidewalls of the cups by ironing the sidewalls in a series of ironing rings of a die stack, applying an oil-in-water emulsion coolant from a coolant system as a lubricant and coolant into the die stack, and trimming the free end

of the drawn and ironed cups to obtain can shells having uniform height, the improvement of:

rinsing the can shells with water subsequent to the last ironing step, and prior to trimming, thereby mixing coolant and rinse water;



separating the coolant from the rinse water by passing the combined coolant and rinse water along one side of a membrane in an ultrafilter pressurized membrane system;

returning the re-concentrated coolant to the coolant system for re-use in the ironing process; and

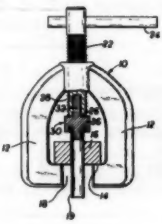
using the separated rinse water as the said rinse water subsequent to the last ironing step, and prior to trimming.

4,535,616

FLARING TOOL

Lloyd R. Eason, Concord, Mich., assignor to Dowley Manufacturing, Inc., Spring Arbor, Mich.

Filed Apr. 8, 1983, Ser. No. 483,113
Int. Cl.³ B21D *19/02, 41/02*
U.S. Cl. 72—116 **1 Claim**



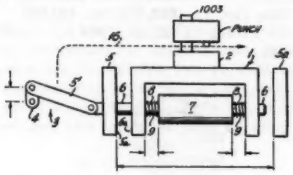
1. In a flaring tool including a yoke having an anvil surface for supporting a tube holding bar and a threaded bore for receiving a threaded actuator, the thread of the bore and actuator having a given lead, the actuator having an outer end having a torque handle mounted thereon and an inner end disposed toward the yoke anvil surface, and a tube flaring head mounted upon the actuator inner end adapted to engage and flare the end of a tube held within the tube holding bar, the improvement comprising, first connection means defined upon the actuator inner end comprising a coaxial bore within the actuator intersecting the actuator inner end and first threads defined within said bore, the tube flaring head comprising an adapter, and second connection means defined upon said adapter adapted to selectively cooperate with said first connection means whereby said adapter is removably mounted upon the actuator inner end, said second connection means comprising a stem defined upon said adapter and second threads defined upon said stem, said second threads mating with said first threads, said first and second threads having a lead different from the given lead of the threads of the threaded actuator and yoke bore to prevent torque forces imposed on said adapter during rotation of the threaded actuator from loosening said adapter on the actuator during retraction.

4,535,617

STAMPING MACHINE

Arnold Ochsner, deceased, late of Naples, Fla. (by Edith Ochsner, Administratrix), assignor to Forster-Willi Corporation, St. Gallen, Switzerland

Filed Jan. 5, 1984, Ser. No. 568,299
Int. Cl.³ B21D *11/04*
U.S. Cl. 72—307 **9 Claims**



1. A material stamping machine comprising

(a) a support frame,

(b) a reciprocally movable carriage supported by said frame,

(c) barrier walls having interfaces and restricting the reciprocal movements of said carriage,

(d) one or more punch and die apparatus carried by said carriage,

(e) power driving means including an eccentric for reciprocally actuating said carriage against the interface of the barrier walls in a pre-determined time sequence,

(f) restraining means connected to said power means and disposed to engage the carriage after wall contact to restrict the movements thereof,

(g) stamping means responsive to said eccentric power means for actuating said punch according to said predetermined time sequence, and

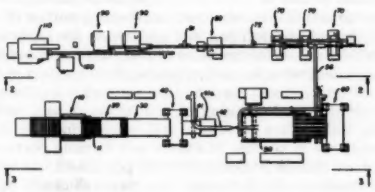
(h) material clamping means responsive to the actuations of said stamping means for clamping and releasing material in the timed sequence.

4,535,618

SYSTEM, METHOD FOR FORMING CONTAINERS

Joseph D. Bulso, Jr., Canton; Stephen D. Doyle, and James A. McClung, both of North Canton, all of Ohio, assignors to Redicon Corporation, Canton, Ohio

Division of Ser. No. 444,789, Nov. 26, 1982, Pat. No. 4,483,172.
This application Jul. 23, 1984, Ser. No. 633,472
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—349 **2 Claims**



1. A method of forming containers from flat metal stock, comprising the steps of:

(A) blanking and cupping the metal to form a cup;

(B) drawing, redrawing, and bottom profiling the cup into a container in a single press; including:

(1) inserting the cup into the press and drawing it,

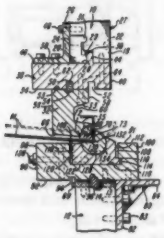
(2) removing the drawn cup from the press to an accumulator/divider table for orientation and inspection;
(3) reinserting the drawn cup into the press and
(4) redrawing and bottom profiling it into a container; and
(5) removing the container from the press;
(C) trimming the drawn and redrawn container;
(D) flanging the drawn and redrawn container; and
(E) beading the container.

4,535,619

ROTARY BENDING, PARTICULARLY FOR PRESS BRAKES

Robert J. Gargrave, 4717 James Hill Rd., Kettering, Ohio 45429

Filed Oct. 13, 1982, Ser. No. 433,882
Int. Cl.³ B21D *37/04*
U.S. Cl. 72—481 **8 Claims**



1. Apparatus providing tooling for a bending and forming of sheet material in a press or press brake, said tooling including two separate halves for connection in a press or press brake to dispose in a relatively opposed normally spaced relation in an open condition thereof and be brought together in a closing condition thereof to produce a bend in and forming of sheet material interposed therebetween, one half of said tooling comprising a forming tool having opposite ends, one of which ends is adapted for connection to a portion of the structure of said press or press brake and the other of which is adapted to project toward and be positioned most adjacent the other of said halves of said tooling which is in an opposed relation thereto, said other of said halves of said tooling comprising a rotary bending tool including a rotor having a notch therein mounted on and for rotation in and with respect to a saddle, said saddle being seated in and for movement relative to a base member, said base member being adapted for the anchoring thereof to another portion of the structure of said press or press brake to position a portion of the notch of said rotor outwardly thereof in an opposed relation to a forming portion of said most adjacent end of said forming tool which is contoured in accordance with the bending and forming operation to be effected on the sheet, means for releasably fixing said saddle and thereby said portion of said notch and the bounding wall surface thereof in one of a plurality of optional positions with reference to said base member and said forming portion of said adjacent end of said forming tool and means for application between adjacent surface portions of said saddle and said base member to determine the said releasably fixed position of said saddle and establish said portion of the notch of said rotor so as to provide that in the closing of said halves of said tooling bounding wall surface portions of said notch, which are made complementary in contour to that of said forming portion of said tool are spaced from said forming portion of said tool a distance corresponding substantially with the thickness of the stock being worked by said tooling.

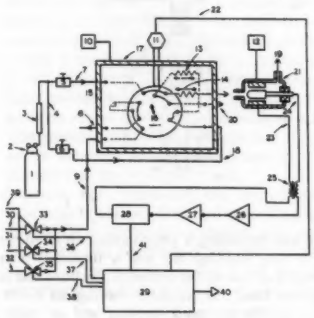
3. A method of conducting a forming operation on sheet stock in a press or press brake utilizing a die assembly respective portions of which are respectively mounted to the ram and bed thereof wherein one of said portions of said die assembly comprises a tool including a main body having a head end and an opposite end, the head end of which is connected to the ram of the press or press brake, as the case may be, to position said main body with said opposite end thereof in an outwardly projected relation thereto, said opposite end including a forming portion of said tool, surface portions of which respectively differ in configuration and/or dimension to provide it with a construction conditioning it for use in different forming operations, said main body including a leading face and a trailing face, with reference to the diretion in which material is applied to the press or press brake in the forming thereof, and said opposite end of said main body presenting means defining a surface which is angularly inclined from said leading face to and in the direction of said trailing face, and another portion of said die assembly comprises rotary bending apparatus mounted on and in connection with the bed of the press or press brake including a notched rotor mounted on and for rotation in and with respect to a saddle, said saddle being contained in and for movement relative to a base member to selectively position said rotor and the notch thereof in relation to said forming portion of said tool to provide, on closing of said press or press brake on sheet stock interposed therebetween for forming, that the bounding wall surface portions of said notch, which are made complementary in contour to that of said forming portion of said tool are spaced from said forming portion of said tool in accordance with the thickness of the stock worked characterized by inserting sheet stock to be formed between said forming tool and said rotary bending apparatus and establishing said stock in an attitude and orientation which corresponds with the angle of inclination of said angularly inclined surface of said opposite end of said main body.

4,535,620

METHOD FOR AUTOMATICALLY MEASURING THE AMOUNT OF WATER IN A NATURAL GAS PIPELINE WITH THE AID OF A COMPUTER CONTROLLED GAS CHROMATOGRAPH

Richard D. Cunningham, Omaha, Nebr., assignor to InterNorth, Inc., Omaha, Nebr.

Filed Aug. 12, 1983, Ser. No. 522,791
Int. Cl.³ G01N *31/08*
U.S. Cl. 73—23.1 **1 Claim**

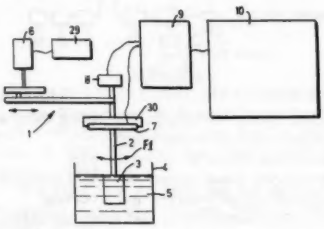


1. A method for automatically measuring low water levels in a natural gas pipeline with the aid of an electron capture gas chromatograph selectively fluidly connected to the natural gas pipeline and a computer control unit, comprising the steps of:
providing said computer control unit with a data base for operating said electron capture gas chromatograph, the data base capable of at least,
(a) periodically causing a sample of the natural gas to be supplied to said gas chromatograph;
(b) operating said gas chromatograph to measure the water in said natural gas;
(c) computing the amount of said water in said natural gas; and
(d) reporting the amount of said water in said natural gas.

4,535,621
PROCESS AND APPARATUS FOR MEASURING RHEOLOGICAL PROPERTIES OF SEMI-SOLID BODIES BY HARMONIC SHEAR IN ROTATION

Alain Gervais, Igny; Daniel Vermeire, Jouy en Josas; Olivier Cerf, Paris, and Jacques Toux, Chartres, all of France, assignors to Institut National de la Recherche Agronomique, France

Filed Oct. 25, 1983, Ser. No. 545,300
Claims priority, application France, Oct. 25, 1982, 82 17835
Int. Cl.³ G01N *11/14, 33/04*
U.S. Cl. 73—59 **12 Claims**



1. A process for measuring rheological properties of semi-solid bodies utilizing a measuring head (3) including an axle, comprising the steps of:

introducing the measuring head into the body to be tested;

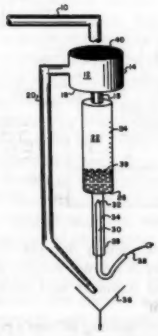
reciprocally rotating the measuring head axle starting from a continuous circular motion, converting said continuous circular motion into a rectilinear reciprocating motion and then into a sinusoidal or pseudo-sinusoidal rotational motion, thereby driving the measuring head with a sinusoidal or pseudo-sinusoidal rotational motion, with controllable frequency and amplitude, and independently of the body to be tested; and

determining the conditions of motion of the head which serve as values representing the rheological properties of the semi-solid body due to the stressed applied by the head moving within the body.

4,535,622
NON-CLOGGING DEPOSIT MONITOR

Alan M. Yeoman, Naperville, and Richard J. Mouché , Batavia, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 28, 1983, Ser. No. 518,182
Int. Cl.³ G01N *15/00*
U.S. Cl. 73—61.2 **3 Claims**

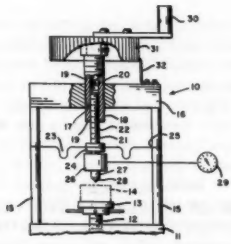


1. A non-clogging deposit monitor for measuring the tendency of inorganic particulate containing water to form scale deposits on equipment surfaces exposed thereto comprising a constant head tank having associated therewith a rough inlet screen, an overflow line, and a head tank drain positioned in its bottom; a vertically disposed cylindrical tank having marked thereon volume indicating graduations positioned below the constant head tank drain and adapted to receive the entire discharge from said drain and fitted with a drain tube at the bottom of the cylindrical tank; and a conically tipped cylindrical member of smaller diameter than the drain tube positioned concentrically within said drain tube, thereby defining an annular opening between the drain tube and the cylindrical member.

4,535,623
MATERIAL HARDNESS TESTING APPARATUS

Paul Gilberto, 145 Carmen Rd., Milford, Conn. 06460

Continuation of Ser. No. 465,756, Feb. 11, 1983, abandoned, which is a continuation of Ser. No. 231,108, Feb. 3, 1981, abandoned, which is a continuation of Ser. No. 18,816, Mar. 8, 1979, abandoned. This application May 10, 1984, Ser. No. 608,995
Int. Cl.³ G01M *3/42*
U.S. Cl. 73—81 **19 Claims**



1. In an apparatus for testing the hardness of material comprising a rigid platform on which the material is adapted to be positioned, a frame spaced from the platform, means mounted on the frame for linear movement towards and away from the platform, said means comprising an end part (21) adjacent the platform and having a penetrating end (28) adapted to engage the surface of the material (14) and an other end (20) adjacent the frame 16, compressive force measuring means (26, 29) for indicating the force exerted by the penetrating end on the material, and penetrating motion measuring means (31, 32) for indicating the penetrating motion of the penetrating end into the material, the improvement comprising:

differential thread means comprising a rotatable part (18) having a pair of coaxial threads (19, 19) of different pitches formed thereon; means (17) on the frame (16) engaging the threads of one pitch; means on the other end (20) of the end part (21) engaging the threads of another pitch; means (30) for revolving the rotatable part to effect linear movement of the penetrating end, and flexure means (23) connected between the frame 15 and the end part allowing free axial motion between said frame and said end part but preventing relative rotation therebetween.

4,535,624
ENGINE MONITORING SYSTEM

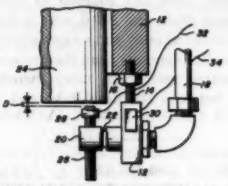
Haskell Ginns, Belmont, and Albert E. Finn, Marblehead, both of Mass., assignors to The Indikon Company, Inc., Cambridge, Mass.

Filed Jun. 1, 1983, Ser. No. 499,820
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—119 R **8 Claims**

1. An extent of travel measurement system comprising:

transducer means for providing a signal corresponding to the position of a cyclically moving element;

detector means responsive to the signal from said transducer means for providing an output signal corresponding to an extreme in the position of said element;



means for averaging said detector means output signal over a selected number of element cycles of motion providing an averaged extreme position output signal; and

display means for providing a visual indication of the averaged extreme position output signal.

4,535,625

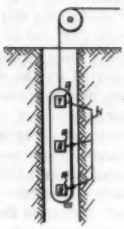
METHOD OF INCREASING THE VERTICAL RESOLUTION OF WELL LOG DATA

W. D. Lyle, Jr., Grapevine, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 6, 1984, Ser. No. 577,093

Int. Cl.³ E21B *47/00*

U.S. Cl. 73—152 **5 Claims**



1. A method of increasing the vertical resolution of well log data, comprising the steps of:

moving a well logging tool relative to a well bore and taking parameter measurements at a plurality of discrete points along the well bore to produce a log of said parameter measurements, said parameter measurements being weighted average measurements of true parameter values;

inverse filtering the data contained in said log to reduce the effects of weighted averaging on parameter measurements, said inverse filtering operation determining higher resolution estimates of said logged measurements from information contained in said measurements, and the response function of said logging tool and without emulating a white-noise driven system;

producing a log of said inverse filtered data which more accurately reflects said true parameter values.

4,535,626

DISPLAY SYSTEM TO INDICATE SAILING DATA OF A SMALL SIZE BOAT

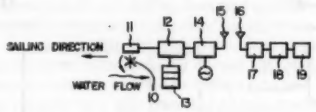
Toshibumi Wakayama, Tokyo, Japan, assignor to Nippon Eurotec Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,379

Claims priority, application Japan, Sep. 5, 1983, 58-162972

Int. Cl.³ G01C *21/10*

U.S. Cl. 73—187 **3 Claims**



1. A display system to indicate the sailing data, such as, speed of a small size boat comprising:

a speed detecting sensor set up on the hull,

a speed measuring means connected to said sensor in which pulses therefrom are received and processed,

a memory means connected to said speed measuring means in which sailing data thus processed is stored,

a transmitting means connected to said memory means in which the data thus stored is read, modulated and radio-transmitted periodically,

a receiving means of wristwatch type, separated from said transmitting means, in which the data thus transmitted is received and displayed on an indicator,

the radio communication being done by using weak electric waves.

4,535,627

METHOD OF AND APPARATUS FOR DETERMINING THE LEVEL OF LIQUID IN A VESSEL

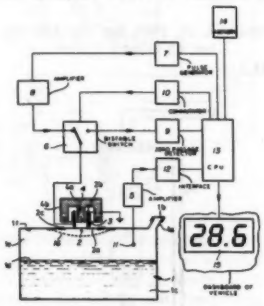
Jean-Louis Prost, Geneva, and Daniel Gross, Carouge, both of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Mar. 31, 1983, Ser. No. 480,690

Claims priority, application Switzerland, Apr. 1, 1982, 2014/82

Int. Cl.³ G01F *17/00, 23/18*

U.S. Cl. 73—290 B **16 Claims**



1. A method of determining the quantity of a liquid in a variably filled container of known volume wherein a gas space is provided above said liquid in said container, the method comprising the steps of:

(a) selectively forcibly moving at least a portion of one of the walls of the container so as to vary the volume of said gas space briefly and thereafter permitting the pressure in said space to oscillate with a natural frequency, said portion being plastically deformable;

(b) transforming the oscillation of said pressure in said space into a signal of an amplitude varying with the frequency of said oscillation;

(c) detecting the period of said signal and calculating the volume of said gas space as a function of said period; and

(d) indicating the difference between the volume of said gas space and the known volume of said container as a measure of the volume of the liquid in said container.

4,535,628

APPARATUS FOR LEVEL MEASUREMENTS

Bjorn R. Hope, Kampeveien 20, N-1350 Lommedalen, Norway

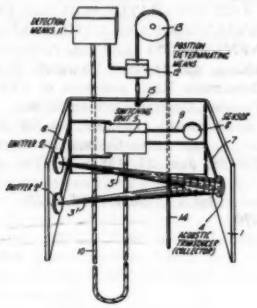
PCT No. PCT/NO82/00028, § 371 Date Jan. 21, 1983, § 102(e) Date Jan. 21, 1983, PCT Pub. No. WO82/04122, PCT Pub. Date Nov. 25, 1982

PCT Filed May 21, 1982, Ser. No. 463,885

Claims priority, application Norway, May 22, 1981, 811752; May 19, 1982, 821682

Int. Cl.³ G01F *23/28;* G01N *29/02*

U.S. Cl. 73—290 V **8 Claims**



1. An apparatus for measuring acoustic transmission characteristics of at least one medium to be measured, e.g. for measuring levels of the medium, in which at least one elongated hollow chamber is immersed, said hollow chamber comprising a guiding chamber filled with an acoustic connection liquid, wherein at least two separated transducers are immersed in said connection liquid inside said guiding chamber, said transducers being arranged on respective branches of a mounting support so that said transducers face one another said guiding chamber having a cross-sectional shape such that a directional acoustic path between opposite transducers passes through said medium to be measured, said guiding chamber being closed at its bottom to avoid contact between said medium and said transducers, and wherein said mounting support on which said transducers are mounted has a cross-sectional shape substantially the same as that of said guiding chamber, but of a lesser cross-sectional area than that of said guiding chamber, one said transducer being arranged on one side of said support and serving as an emitter of an acoustic wave that is emitted toward another said transducer serving as a collector on the other side of said support, said support being selectively movable within said chamber, the primary acoustic path extending from said emitter, through said connection liquid surrounding it, through the wall of the guiding chamber adjacent thereto, through the medium to be measured, through the guiding chamber wall near the collector, through the connection liquid surrounding said collector and to the collector itself.

4,535,629

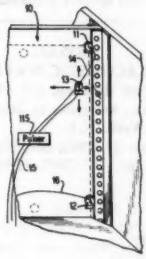
METHOD AND APPARATUS FOR STRUCTURAL MONITORING WITH ACOUSTIC EMISSION AND USING PATTERN RECOGNITION

David W. Prine, Maywood, Ill., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Mar. 16, 1984, Ser. No. 590,378

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—587 **7 Claims**



1. Apparatus for detecting and locating flaws in metal bridges or other specimens subject to acoustical emission comprising, first, second and third acoustical transducers with means for attaching them to a bridge in a predetermined pattern with the transducers spaced generally in a straight line, a pulser connected to the one of said transducers which is mounted between the other two transducers, first and second amplifiers connected, respectively, to said first and second transducers, amplitude discriminating means connected to said first and second amplifiers to pass signals with amplitudes above a predetermined level, rate discrimination means connected to the output of said amplitude discriminating means to pass signals which have rates within predetermined criteria, location discriminating means receiving the outputs of said rate discriminating means to determine if the events which pass the energy and rate discrimination tests all come from the same location within preset tolerances, and locating flaws wherein said amplitude discriminating means and said rate discriminating means comprise a microcomputer, and wherein said location determining means is connected to said microcomputer.

4,535,630

MULTIPLE CURVED TRANSDUCERS PROVIDING EXTENDED DEPTH OF FIELD

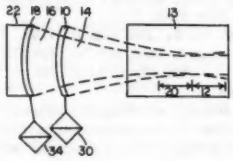
Arthur J. Samodovitz, 1 Lakeshore Dr., Apt. A-4, Farmington, Conn. 06032

Filed Jan. 17, 1983, Ser. No. 458,742

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—642 **12 Claims**



1. Apparatus for focussing ultrasonic waves over a large field comprising:

first and second curved transducers located along an axis,

having similar operating frequencies, and focussing upon adjacent

fields forming a composite, extended field, the curvature of each transducer being continuous, the first transducer being in the path of the focussed waves transmitted by the second transducer, and the first transducer being large enough to intersect substantially all forward, focussed waves transmitted by the second transducer, and

means for coupling the first transducer to the second transducer so that ultrasonic waves can travel efficiently between the first and second transducers.

4,535,631

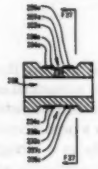
SURFACE ACOUSTIC WAVE SENSORS

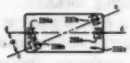
Bikash K. Sinha, West Redding, and Michel Gouilloud, Norwalk, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,240

Int. Cl.³ G01L *11/00*

U.S. Cl. 73—703 **41 Claims**





1. A surface acoustic wave signal frequency apparatus comprising a crystalline diaphragm section having a cylindrical or spherical outer surface and a cylindrical or spherical inner surface, wherein:

one of said outer and inner surfaces is adapted for subjection to an applied pressure; and

the other of said outer and inner surfaces includes a first area thereof adapted for the fabrication of a surface acoustic wave device, said first area having a selected orientation having:

for a first selected propagation direction, a high sensitivity to pressure effects and a low sensitivity to temperature effects; and

for a second selected propagation direction, a low sensitivity to pressure effects and a high sensitivity to temperature effects.

4,535,632

SURFACE ACOUSTIC WAVE SENSORS

Bikash K. Sinha, West Redding, and Michel Gouilloud, Norwalk, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 427,240, Sep. 29, 1982,. This application Aug. 1, 1984, Ser. No. 636,873

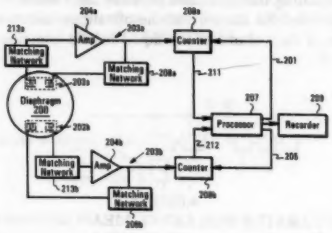
Int. Cl.³ G01L *11/00*

U.S. Cl. 73—703 **15 Claims**

1. A surface acoustic wave signal frequency apparatus comprising a crystalline diaphragm section having a cylindrical or spherical outer surface and a cylindrical or spherical inner surface, wherein:

one of said outer and inner surfaces is adapted for subjection to an applied pressure;

the other of said outer and inner surfaces includes a first area thereof adapted for the fabrication of a surface acoustic wave device, said first area having a selected orientation having, for a selected propagation direction, a high sensitivity to pressure effects and a low sensitivity to temperature effects; and



said other surface further includes a second area thereof adapted for the fabrication of a surface acoustic wave device, said second area having a selected orientation having, for a selected propagation direction, a low sensitivity to pressure effects and a high sensitivity to temperature effects.

4,535,633

METHOD AND APPARATUS FOR THE PROTECTION OF ANALYZERS AND OTHER SENSITIVE COMPONENTS FROM SOILING AND CORROSION

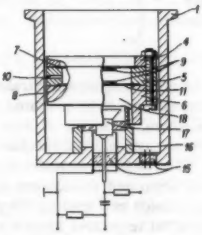
Wolfgang Schiess, and Herbert Thorandt, both of Dresden, German Democratic Rep., assignors to VEB Hochvakuum Dresden, Dresden, German Democratic Rep.

Filed Jun. 13, 1984, Ser. No. 620,296

Claims priority, application German Democratic Rep., Jun. 29, 1983, 2525158; Jun. 29, 1983, 2525174; Jun. 29, 1983, 2525166

Int. Cl.³ G01L *7/08, 9/12*

U.S. Cl. 73—706 **20 Claims**



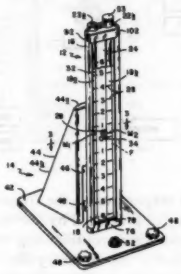
12. An apparatus for the protection of a sensitive device by prevention of the intrusion of a deleterious component into the inside of said sensitive device which comprises a sensitive device, a gas-containing transfer or measurement connection member, said connection member extending to the inside of said sensitive device and containing a low frequency oscillatable diaphragm element, said diaphragm element comprising an alternating pressure transmitter system, means to oscillate said diaphragm element in periodic low operating frequency, so that said diaphragm element produces an alternating pressure in the environment of said connection member by periodic movement, so as to transmit kinetic energy to the gaseous phase in said connection member, whereby kinetic energy is transmitted to any deleterious component in said gaseous phase, thereby forcing said deleterious component in an opposite direction relative to said sensitive device, so that the intrusion of said deleterious component into said sensitive device is prevented.

4,535,634

MANOMETER

S. J. Troutman, Jr., and D. Wayne Hixenbaugh, both of Albuquerque, N. Mex., assignors to Dynatech Frontier Corporation, Albuquerque, N. Mex.

Filed May 25, 1984, Ser. No. 614,055
Int. Cl.[3] G01L 7/18
U.S. Cl. 73—747 30 Claims



1. Manometer apparatus comprising

A. an elongated rigid frame

1. formed as a channel having a rear wall and a pair of spaced-apart sidewalls, and
2. defining an internal scale slide extending substantially the entire length of the frame;

B. an elongated open-ended manometer tube positioned in the frame;

C. upper closure means for closing the upper end the frame, said upper closure means including fluid conduit means extending through the closure means and establishing a fluid connection to one end of the tube;

D. lower closure means closing the lower end of the frame;

E. means for removeably securing the upper and lower closure means to the upper and lower ends of the frame;

F. an elongated, card-like scale, said scale being

1. somewhat shorter than the frame, and
2. slideably mounted in said scale slide for lengthwise movement therein; and

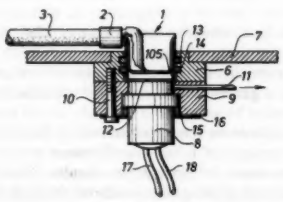
G. scale adjusting means releasably secured to the scale and extending outside of said frame for adjustably positioning the scale lengthwise in the frame relative to the tube.

4,535,635

PRESSURE MEASURING SYSTEM

Jan S. Claren, Lund; Jan-Bertil Jeppsson, Lomma, and Peter R. Staehr, Lund, all of Sweden, assignors to Gambro Lundia AB, Sweden

Filed Jun. 21, 1984, Ser. No. 622,798
Claims priority, application Sweden, Jun. 30, 1983, 8303740
Int. Cl.[3] G01L 7/08
U.S. Cl. 73—756 20 Claims



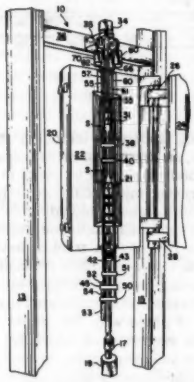
1. Apparatus for measuring the pressure of a fluid comprising pressure sensing means and pressure transmitting means, said pressure transmitting means having at least one inlet for receiving said fluid whose pressure is to be measured and a pressure transmitting wall member in fluid communication with said inlet, whereby said pressure transmitting wall member may be brought into contact with said pressure sensing means, and negative pressure means for drawing said pressure transmitting wall member against said pressure sensing means so that said pressure sensing means can substantially measure the absolute pressure of said fluid.

4,535,636

TENSILE TESTING APPARATUS

Linda B. Blackburn, and John R. Ellingsworth, both of Hampton, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 19, 1984, Ser. No. 590,923
Int. Cl.[3] G01N 3/08, 3/18
U.S. Cl. 73—831 6 Claims



1. In combination with an extensometer for accurately measuring strain on foil-gage type materials under elevated temperature test conditions including a displacement transducer strain measuring device, a clam shell type furnace, a pair of platens for supporting a test specimen within the furnace, and means for exerting a constant tensile load on the test sample supported therein, the improvement therewith comprising:

counterbalance means connected to each of said pair of platens to offset the weight contribution of the extensometer on the test specimen,

sample engaging means forming part of each of said pair of platens, said sample engaging means in each said platen comprising a first flat edge surface and a second conical tip surface,

said flat edge surface and said conical tip surface engaging and retaining a foil-gage type test specimen therebetween, and

means for adjusting relative movement of said flat edge surface and said conical tip surface to adjust and maintain the engagement thereof with the test specimen.

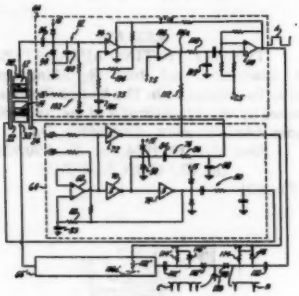
4,535,637
FLOW DETECTION APPARATUS

Murray F. Feller, Citrus County, Fla., assignor to Wilgood Corporation, Dunnellon, Fla.

Continuation-in-part of Ser. No. 487,226, Apr. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 467,138, Feb. 16, 1983, abandoned, which is a continuation-in-part of Ser. No. 427,611, Sep. 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 215,524, Dec. 11, 1980, Pat. No. 4,399,696, which is a continuation-in-part of Ser. No. 150,142, May 15, 1980, Pat. No. 4,333,354, which is a continuation-in-part of Ser. No. 31,419, Apr. 19, 1979, abandoned. This application Feb. 8, 1984, Ser. No. 578,283

Int. Cl.³ G01F *1/56*

U.S. Cl. 73—861.77 **28 Claims**



1. Flow-detecting apparatus including means forming a liquid flow passage, an alternating excitation source, means for developing an excitation pattern in liquid in a region in said passage and for sensing said excitation pattern, said pattern developing and sensing means including (a) excitation electrode means connected to said excitation source and (b) sensing electrode means, a flow-driven tracker having at least one pattern-distorting element movably cyclically through said region, signal-receiving means connected to said sensing electrode means for providing an output signal that is alternately in phase with or out of phase with the output of the excitation source during cyclic movement of the tracker, and flow-representing signal means including gating means for combining the output of said alternating excitation source with the output of said signal-receiving means to provide trains of signals and signal-interruption intervals representing cyclic movement of said pattern-distorting element past the sensing electrode means and the excitation electrode means.

4,535,638
RESONATOR TRANSDUCER SYSTEM WITH TEMPERATURE COMPENSATION

Errol P. EerNisse, Sandy, and Roger W. Ward, Salt Lake City, both of Utah, assignors to Quartztronics, Inc., Salt Lake City, Utah

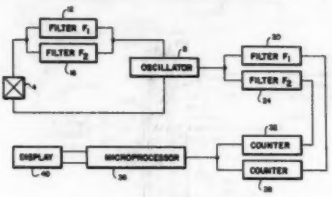
Filed Oct. 3, 1983, Ser. No. 538,171

Int. Cl.³ G01L *1/10, 1/16*

U.S. Cl. 73—862.59 **32 Claims**

1. A resonator transducer system comprising a single vibratory element which is responsive to an oscillatory electrical signal for resonating at frequencies f_1 and f_2, selected from the fundamental frequency and overtone frequencies of the vibratory element, where the two frequencies vary with variation in force or other parameter applied to the vibratory element and with variation in temperature to which the vibratory element is exposed, with the magnitude of variation due to the change in temperature for frequency f_1 being different from that for frequency f_2,

means for applying an oscillatory signal to the vibratory element to cause the vibratory element to resonate and for producing a vibratory signal having a frequency f_1 and a frequency f_2 which follow the selected frequencies f_1 and f_2 respectively of the vibratory element, and



processing means responsive to the frequencies f_1 and f_2 of the vibratory signal produced by the oscillator means for producing a first signal representing the force or other parameter applied to the vibratory element, and a second signal representing the temperature to which the vibratory element is subjected.

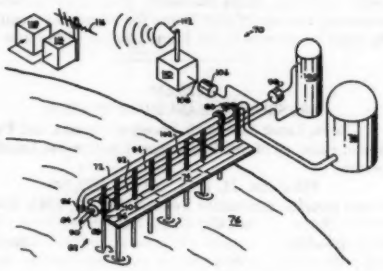
4,535,639
VAPOR SPILL MONITORING METHOD

Gregory M. Bianchini, and Thomas G. McRae, both of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 23, 1983, Ser. No. 507,188

Int. Cl.³ G01N *1/24*

U.S. Cl. 73—863.11 **7 Claims**



1. Method for continuous monitoring of LNG composition from a spill pipe comprising:

positioning the tip of a probe having three concentric spaced tubes in a generally downward orientation in a flow of LNG;

applying suction on the opposite end of the inside tube to draw a quantity of LNG into the inner tube;

flowing hot water in through the annular channel between the inner and middle tubes, and out through the annular channel between the middle and outer tubes, to provide heat transfer to vaporize the LNG;

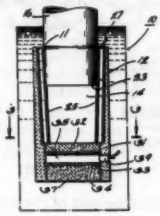
transporting the vaporized LNG gas to a remote analyzer for determining the composition of the LNG.

4,535,640

CERAMIC FIBER MOLTEN METAL SAMPLER

Richard A. Falk, 519 Westminster Dr., Waukesha, Wis. 53186

Filed Nov. 2, 1983, Ser. No. 547,930
Int. Cl.³ G01N 1/12
U.S. Cl. 73—864.55 8 Claims



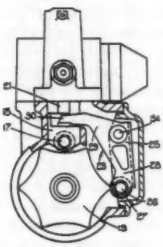
1. A molten metal sampler comprising first wall means defining a generally cylindrical sample cavity, said first wall means being formed from temperature resistant fibers, and second wall means for sealing the ends of said sample cavity, said second wall means comprising molded sand-resin plugs spanning said cavity, said plugs being in sealing contact with said first wall means and a side entry port to introduce molten metal between said plugs, and smooth plates between said sand plugs and spaced to form disc samples with smooth surfaces.

4,535,641

RECIPROCATING PLUNGER FUEL INJECTION PUMP

Miroslav Kriz, and Kenneth M. Harris, both of London, England, assignors to Lucas Industries plc, Birmingham, England

Filed Jun. 8, 1982, Ser. No. 386,272
Claims priority, application United Kingdom, Jun. 13, 1981, 8118238
Int. Cl.³ F16H 25/14, 53/06; F04B 7/00
U.S. Cl. 74—53 3 Claims



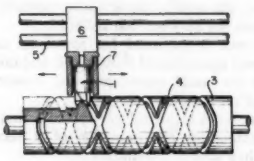
1. A reciprocating plunger fuel injection pump comprising a body defining a bore in which a plunger is mounted, a tappet assembly including a roller, a rotary cam mounted on a rotary cam shaft, a plurality of equiangularly shaped cam lobes on said cam, said roller co-operating with the cam to impart movement to the tappet assembly and plunger in one direction to cause fuel to be displaced from said bore, a lever assembly pivotally mounted in the body, said lever assembly comprising first and second levers, the first lever being of bellcrank form having a forked end of one arm for engagement with a head on the plunger and the end of the other arm engaging the second lever, one side of the head being engaged by the tappet assembly and the other side of the head being engaged by the forked end, said second lever adjacent its point of contact with the first lever mounting a roller engaging with the cam, the arrangement being such that following movement in said one direction by a cam lobe, the plunger and tappet assembly upon continued rotation of the cam are moved in the other direction by one of said lobes.

4,535,642

TRAVERSING MECHANISM

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan

Filed Apr. 28, 1983, Ser. No. 489,356
Int. Cl.³ F16H 25/12, 53/06
U.S. Cl. 74—58 3 Claims



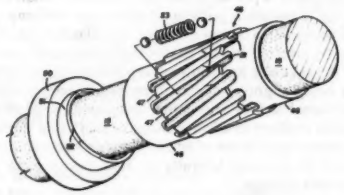
1. A traversing mechanism comprising a guide member and a cam shaft having on its outer surface an endless helical cam groove, said guide member comprising a cam shoe adapted to engage with said cam groove to thereby cause the guide member to reciprocate along the axis of said cam shaft, and further including a cylindrical retaining portion having an axis essentially perpendicular to said cam shaft axis for receiving said cam shoe, said cam shoe comprising a rotatable member rotatably fitted into said cylindrical retaining portion and a separate slidable member fixedly mounted in said rotatable member, said slidable member being formed from a flat piece of hard ceramic material with one end serving as an engaging end portion to engage said cam groove and slide therein, and said rotatable member being cylindrical and having at one end a grooved retaining slot into which the other end of said slidable member is fitted for assembling of both members.

4,535,643

THREADLESS FEED SCREW

Murray L. Hauptman, 27330 Arborway, Southfield, Mich. 48034

Filed May 10, 1982, Ser. No. 376,063
Int. Cl.³ F16H 27/02
U.S. Cl. 74—89 1 Claim



1. In a feed mechanism of the type including an elongated inner race and an elongated outer race concentrically surrounding said inner race and radially spaced apart therefrom, a cage disposed between said races and a plurality of elongated rollers carried by said cage, said rollers having axes inclined relative to the race axes, the inner surface of said outer race and the outer surface of said inner race defining the facing surfaces of the races; said rollers normally being in contact with said facing surfaces, the improvement comprising:

a portion of at least one of said facing surfaces having a recess for providing a clearance, said rollers each being sequentially out of contact with at least one of said facing surfaces when each said roller is in said recess;

each of said rollers is of lesser axial length than the axial length of said cage, said rollers each rolling and also moving axially in a first direction in said cage; each roller moving axially in a second direction opposite to said first direction when each said roller is in said recess;

said cage includes a plurality of elongated slots; each of said plurality of elongated rollers being mounted in one of said slots; each of said rollers being of lesser axial length than said slot;

said mechanism further includes a cam means positioned at opposite ends of said cage, said cam means for moving said rollers when said rollers are in said recess;

each cam means includes an annular sleeve having an axial extension, the axially inwardmost portion of each such cam means for moving said rollers;

said inner race is mounted for rotational movement and constrained against axial movement, and said outer race is mounted for axial movement and constrained against rotational movement; and

said cage includes a central portion of a first diameter and axially extending end portions of a second diameter smaller than said first diameter.

4,535,644

LEVER UNIT IN PARTICULAR FOR A CYCLE

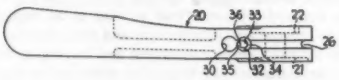
Maurice E. L. Coué, Feucherolles, France, assignor to Huret et ses Fils, Nanterre, France

Division of Ser. No. 452,710, Dec. 23, 1982,. This application Dec. 29, 1983, Ser. No. 566,490

Claims priority, application France, Dec. 30, 1981, 81 24503

Int. Cl.³ F16C *1/10*; G05G *11/00*

U.S. Cl. 74—489 **8 Claims**



1. A lever unit for combination with a cable and cable head which head is fixed to an end of the cable and has a larger cross-sectional size than that of said cable, said lever comprising means mounting the lever on a collar so as to be rotatable about an axis, and a throughway cavity in the lever, said cavity having a part of a large cross-sectional size large enough to receive said cable head and a part of a small cross-sectional size large enough to freely receive said cable but too small to allow passage of said head therethrough, whereby said two cavity parts define a shoulder against which shoulder said head abuts when said cable is placed in said cavity part of small cross-sectional size, a partition portion of said lever defining a lateral passage providing a lateral entrance to said cavity to allow said cable to be inserted in said cavity by shifting said cable transversely of said cable and transversely of said cavity, said lateral passage being slightly smaller in cross-sectional size than the cross-sectional size of said cable, said partition portion being sufficiently resilient to allow passage of said cable through said passage upon application of lateral force on said cable whereby said cable is retained laterally in said cavity after passage through said passage.

4,535,645

VEHICLE STEERING SUB-ASSEMBLY

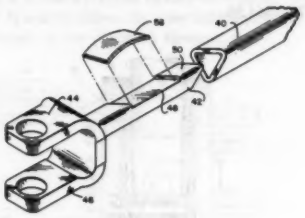
James De Bisschop, Litchfield; Anthony A. Neri, and Thomas J. Williams, both of Torrington, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Mar. 24, 1983, Ser. No. 478,318

Int. Cl.³ B62D *1/16*

U.S. Cl. 74—492 **4 Claims**

1. In a vehicle steering assembly: a telescopically arranged coaxial rotatable driving shaft and rotatable driven shaft, said shafts having complementary substantially triangular cross-sectional shapes with two of the sides of the rotatable driven shaft abutting against corresponding sides of the rotatable driving shaft to prevent relative rotation of the rotatable driving shaft with respect to the rotatable riven shaft; and a spring continuously engaging, the third side of the rotatable driven



shaft and the corresponding side of the rotatable driving shaft, the spring being adapted to provide a predetermined spring force of a magnitude to permit one shaft to slide within the other shaft.

4,535,646

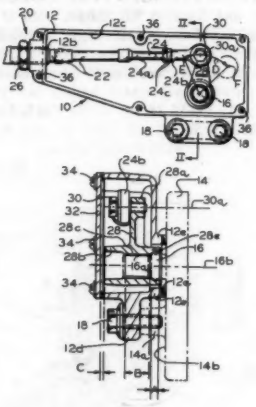
THROTTLE LINKAGE STRUCTURE AND METHOD FOR ITS ASSEMBLY AND DISASSEMBLY

Ramon C. Kohler, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 261,095, Oct. 9, 1980, abandoned. This application Feb. 7, 1983, Ser. No. 483,079

Int. Cl.³ F16C *1/10*

U.S. Cl. 74—501 R **9 Claims**



1. A throttle linkage structure (**10**) which is readily removable from and reassemblable with a rotatable governor shaft (**16,16'**) protruding from a mounting member (**14**), said throttle linkage structure (**10**) comprising:

a housing (**12**) which is attachable to the mounting member (**14**), said housing (**12**) having a governor shaft opening (**12*a***) through which the shaft (**16,16'**) is extendable, a linkage opening (**12*b***), and an access opening (**12*c***) for inspecting the interior of said housing (**12**);

a throttle control structure (**20**) extendable through said linkage opening (**12*b***), said throttle control structure (**20**) being axially displaceable relative to said housing (**12**) between two displacement limits (E,F), said throttle control structure (**20**) including a connecting lever (**28,28'**) disposed in said housing (**12**) and having an end (**28*b***) including a guide neck (**28*e***) which extends into the governor shaft opening (**12*a***), said end (**28*b***) being engageable

with the governor shaft (16,16') for a predetermined axial distance (B) so as to rotate therewith;

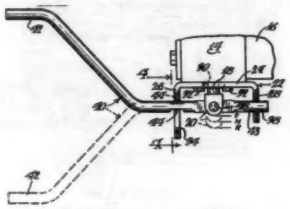
a cover (32) attachable to said housing (12) across said access opening (12c), said cover (32) being axially separated from said connecting lever (28,28') by a separation distance (C) which is less than said predetermined engagement distance (B) to restrict axial displacement of said connecting lever (28,28') and the governor shaft (16,16').

4,535,647

CONTROL HANDLE ARRANGEMENT FOR POWER TAKEOFF VALVE

Roger T. Gault, Wild Rose, Wis., assignor to Ingersoll Equipment Co., Inc., Winneconne, Wis.

Filed Apr. 25, 1983, Ser. No. 488,367
Int. Cl.³ G05G 1/10
U.S. Cl. 74—543 **9 Claims**



1. A control handle arrangement for selectively moving a reciprocable valve member of a self-centering valve, comprising:

handle bracket means adapted for mounting in association with said valve member, said bracket means defining a guide slot;

control handle means adapted to be mounted in association with said bracket means and extend through said guide slot of said bracket means, said handle means being adapted for releasable operative connection with said valve member for selectively positioning said handle means in either of first and second positions with respect to said valve member and said bracket means, whereby movement of said handle means in a first direction within said guide slot of said bracket means moves said valve member from a first neutral position thereof to a second position thereof; and

selectively operable retaining means for retaining said handle in a position in which said valve member is maintained in said second position thereof, said retaining means comprising detent means defined by said bracket means in operative association with said guide slot, said retaining means being operable by movement of said handle means into said detent means when said handle means is operatively connected to said valve member in said first position of said handle means, said retaining means being inoperable whereby said handle means cannot be moved into said detent means when said handle means is operatively connected with said valve member in said second position of said handle means.

4,535,648

CONTROL HANDLE EXTENSION

Jack C. Stelzer, 11786 Duchess, Detroit, Mich. 48224, and Joseph E. Fritsch, 14001 Sherwood, Oak Park, Mich. 48237

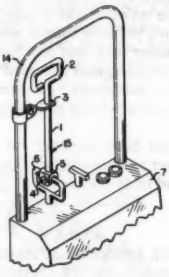
Filed Jul. 5, 1983, Ser. No. 510,546
Int. Cl.³ G05G 1/00
U.S. Cl. 74—544 **10 Claims**

1. A control handle extension comprising:

a rod-like member having a first end portion including a handle rotatable with said rod-like member and a second end portion including an enlarged shoulder with a plurality of flanges extending axially to said enlarged shoulder;

a u-shaped connecting bracket slidably disposed on the second end portion of said rod-like member;

said connecting bracket having an opening through its center section whose contour, including enough radial clearance to facilitate axial and tilting movement, is similar to a cross section of said rod-like member taken through said flanges;



whereby said flanges prevent rotary movement between said rod-like member and said connecting bracket;

said connecting bracket including spaced apart parallel side portions extending on either side of a control handle used on a power-operated device;

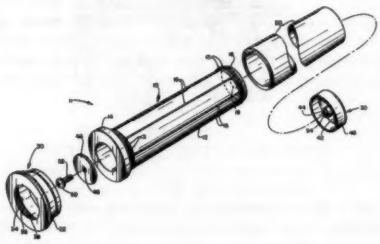
fastening means to rigidly attach said parallel side portions to said control handle.

4,535,649

ANTI-SLIP HANDLEBAR GRIP

Alwin J. Stahel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.

Filed Jan. 28, 1983, Ser. No. 461,755
Int. Cl.³ B62K 21/26
U.S. Cl. 74—551.9 **4 Claims**



1. A handlebar grip comprising:

a. a body member for engaging a handlebar as a grip, the body member comprising:

1. a hard polymer tube having one end open for slipping partially onto one end of said handlebar and the other end closed and having an orifice therein of a diameter smaller than the inside diameter of said tube and with a hard polymer shoulder integrally formed on said open end of said tube and extending outwardly perpendicular to the outer surface of said tube, said hard, polymer tube also comprising at least one rib extending circumferentially about each end of said tube for engaging a cylindrical shock absorbent layer and preventing movement of said cylindrical shock absorbent layer along the longitudinal axis of said tube, and

2. a plurality of ribs extending along the longitudinal axis

of the outer surface of said tube to engage said shock absorbent layer and prevent rotation of said shock absorbent layer about the circumference of said tube;

b. said shock absorbent layer being formed of a sponge polymer material for use overlaying said body member; and wherein said shock absorbent layer is a sponge polymer cylinder with both ends open and having an inside diameter similar to the outside diameter of said hard polymer tube thereby permitting said longitudinally and circumferentially extending ribs on said tube to engage said sponge polymer and prevent longitudinal and circumferential slippage between said sponge polymer and said tube when said hard polymer tube is inserted into said sponge polymer cylinder such that one end of said sponge polymer cylinder abuts against said hard polymer shoulder and the other end of said sponge polymer cylinder is conterminous with the other closed end of said hard polymer tube; and

c. means on said body member for engaging said shock absorbent layer and preventing slippage of said layer with respect to said body member.

4,535,650

FOUR-WHEEL DRIVING APPARATUS WITH AN AUTOMATIC TRANSMISSION

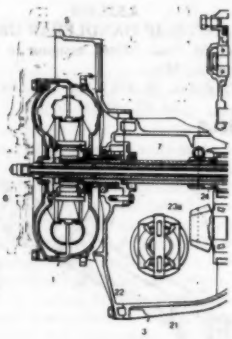
Masayuki Kodama, Hachioji, and Toshio Kobayashi, Tokyo, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 333,219

Claims priority, application Japan, Dec. 24, 1980, 55-183370; Dec. 24, 1980, 55-186083[U]; Dec. 24, 1980, 55-186084[U]; Dec. 24, 1980, 55-186085[U]

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—665 GA **11 Claims**



1. In a four-wheel driving apparatus with an automatic transmission for a vehicle having a torque converter connected to an engine mounted on a vehicle and having a turbine shaft for connecting the output of the torque converter to said automatic transmission, the improvement comprising

an output shaft of said automatic transmission, said output shaft being forwardly extended from the automatic transmission,

a driving gear secured to the output shaft,

a driving pinion shaft operatively connected to said driving gear,

a pinion formed on one end of said driving pinion shaft,

means comprising a final reduction device operatively connected to said pinion for driving front wheels of the vehicle;

a rear drive shaft rotatably supported and rearwardly extended along the outside of said automatic transmission,

a driven gear rotatably mounted on said rear drive shaft and operatively connected to said driving gear, and

a clutch device mounted on the rear drive shaft and adapted to connect said driven gear with said rear drive shaft for driving rear wheels of the vehicle.

4,535,651

TORQUE PROPORTIONING DIFFERENTIAL

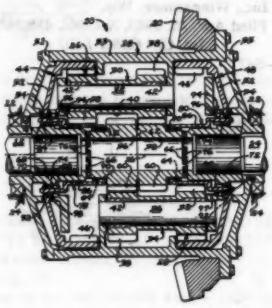
Robert O. Chambers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/01103, § 371 Date Aug. 13, 1982, § 102(e) Date Aug. 13, 1982

PCT Filed Aug. 13, 1982, Ser. No. 645,480

Int. Cl.³ F16H *1/44*

U.S. Cl. 74—711 **40 Claims**



1. In a torque proportioning differential (10/110) having a driven carrier (18/112) rotatable about a central axis (16/114) and first and second output members (68,72/138,140) extending along the axis (16/114), the improvement comprising:

first and second radially outer gears (44,48/122,124);

first and second radially inner gears (56,58/126,128);

gear means (26,28/116,118) for cross connecting the outer and inner gears (44,48,56,58/122,124,126,128), the gear means (26,28/116,118) being rotatably connected to the carrier (18/112); and

disengageable coupling means (78,80/130,134,142,144) for delivering a preselected ratio more than 50% and less than 100% of the total torque to the first output member (68/138) in response to a relative speed increase of the second output member (72/140) with the remaining torque being delivered thereto, the coupling means (78,80/130,134,142,144) being connected to the output members (68,72/138,140) and at least one of each of the outer gears (44,48/122,124) and the inner gears (56,58/126,128).

4,535,652

AUTOMATIC TRANSMISSION AND DIRECT COUPLING CLUTCH FOR VEHICLE

Masao Nishikawa, Tokyo, and Takashi Aoki, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,102

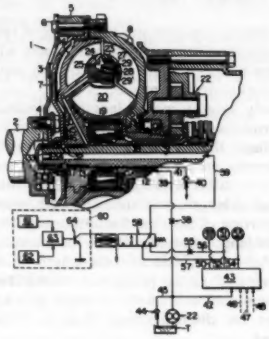
Claims priority, application Japan, Jul. 1, 1982, 57-114233

Int. Cl.³ F16H *47/00, 45/02*

U.S. Cl. 74—733 **9 Claims**

1. An automatic transmission for a vehicle, comprising: a torque convertor equipped with a rotary member on the input side and a rotary member on the output side; a semi-direct coupling clutch interposed between both of said rotary members and actuated by a control fluid pressure to mechanically transmit the torque between both of said rotary members while permitting slip of rotation therebetween; an auxiliary transmission operatively connected to said torque convertor and adapted to effect a speed change operation in accordance with speed change ratios of a plurality of transmission stages; and a

control apparatus for controlling an interconnecting force of said semi-direct coupling clutch such that the force becomes greater in accordance with operation of said auxiliary transmis-



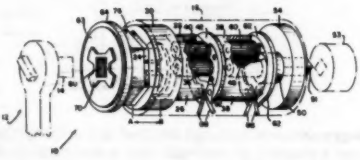
sion at the speed change ratio of a higher transmission stage and becomes lower in accordance with operation of said auxiliary transmission at the speed change ratio of a lower transmission stage.

4,535,653

RATIO SPEED ADAPTOR

Brian Coburn, 79 Bailey St., Lawrence, Mass. 01843

Filed Aug. 16, 1982, Ser. No. 408,135
Int. Cl.³ F16H *57/10, 3/44, 1/28;* **B25B** *17/00*
U.S. Cl. 74—765 **3 Claims**



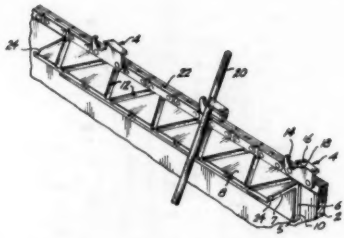
1. A speed transformer adaptor comprising:
a substantially cylindrical casing;
a first gear system coaxially and rotatably positioned in fixed alignment within said casing comprising a first portion forming a drive shaft extending beyond one end of said casing, and a second integral cylindrical portion having internal gear teeth;
a second gear system coaxially and rotatably positioned within said casing and in fixed longitudinal alignment with said first gear system comprising a first portion forming a sun gear coaxially positioned within the cylindrical portion of said first gear system and having external gear teeth, and a second integral cylindrical portion having internal gear teeth;
a first pinion gear disposed in fixed position within the cylindrical portion of said first gear system and meshing with said sun gear of said second gear system and said internal gear of the cylindrical portion of said first gear system;
a third gear system coaxially and rotatably positioned within said casing and in fixed longitudinal alignment with said first and second gear systems comprising a first portion forming a sun gear coaxially positioned within the cylindrical portion of said second gear system and having external gear teeth, and a second integral portion forming a drive shaft extending beyond the other end of said casing;
a second pinion gear disposed in fixed position within the cylindrical portion of said second gear system and meshing with the sun gear of said third gear system and the internal gear of the cylindrical portion of said second gear system; and
a clutch member slidably mounted on said drive shaft of said first gear system and adapted to slidably engage said casing whereby to interlock said casing and gear sytems to provide a direct drive between said input and output shafts.

4,535,654

CHAIN SAW SHARPENING GUIDE

Mark E. White, 1437 W. 11th, Port Angeles, Wash. 98262

Filed Nov. 10, 1983, Ser. No. 550,554
Int. Cl.³ B23D *63/16*
U.S. Cl. 76—36 **2 Claims**



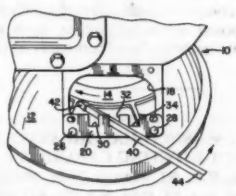
1. A guide for sharpening chain saw blades comprising:
an elongated member having first and second planar faces, said planar faces being orthogonally disposed relative to each other;
a strip of magnetic material affixed to said first face, said magnetic material allowing said guide to be magnetically positioned adjacent to the bar of the chain saw so that said second planar face extends orthogonally outwardly from said chain bar, said second planar face having a plurality of indicia thereon, said indicia being positioned on said second planar face to visually indicate the angle at which a filing device is to be held during filing of a chain saw tooth; and
gauge means formed in the second planar face, the gauge means being positionable immediately adjacent to the cutting edge of the chain saw tooth for gauging the optimum shape of the cutting edge of the chain saw tooth.

4,535,655

ENGINE TURNING TOOL BRACKET

Robert C. Avery, 14 Penny La., Chicago Heights, Ill. 60411

Filed Dec. 1, 1983, Ser. No. 577,041
Int. Cl.³ B25B *31/00*
U.S. Cl. 81—484 **11 Claims**



1. An apparatus useful for manually rotating a rotatable system comprising a stationary housing having a hole therethrough and having said rotatable system located therein; plate means having a plurality of slots, said plate means being secured to said housing so that at least a portion of each of said slots extends into the space defined by the perimeter of said

hole; and bar means having first and second ends, said bar means being capable of being placed at least partially in any of said slots so that said first end contacts said system and said second end is capable of being manually held, whereby manually rotating said bar means about said slot in which said bar means is placed causes said system to rotate.

4,535,656

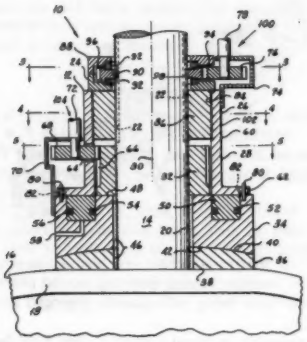
INTEGRAL TENSIONER ASSEMBLY FOR TENSIONING, INSERTING AND REMOVING A STUD

Joseph N. Orban, 12 Greensview Dr., Scotch Plains, N.J. 07076

Continuation-in-part of Ser. No. 243,138, Mar. 12, 1981, abandoned. This application Jun. 28, 1982, Ser. No. 392,740

Int. Cl.³ B25B *29/02*

U.S. Cl. 81—57.38 **7 Claims**



1. A stud rotation system for mounting and removing a stud from a pressure vessel comprising:

(a) a housing disposed about the stud,

(b) rotation means rotatably mounted on the housing adapted to rotate the stud,

(c) drive means engaging the rotation means to rotate the rotation means and the stud whereby the stud will be threadably inserted or removed from the pressure vessel,

(d) holding means disposed within the housing, to engage the stud and to permit turning of and axial motion of the stud,

(e) the holding means includes an engaging nut affixed to the housing threadably receiving the stud to permit relative axial motion therebetween on rotation of the nut or the stud,

(f) the housing has a base,

(g) a sleeve disposed on the base and circumferentially spaced from the stud,

(h) the engaging nut is affixed to the sleeve in axially spaced relation to the base, and

(i) the sleeve comprises a plurality of annular housing rings axially disposed upon each other, each ring having a portion of its inner surface frictionally affixed to the engaging nut.

4,535,657

SOCKET WRENCH HAVING AUTOMATIC NUT-EJECTING CAPABILITY

Eugene A. Farris, R.R. #1, Murray, Nebr. 68409

Filed Jun. 18, 1984, Ser. No. 621,610

Int. Cl.³ B25B *13/02*

U.S. Cl. 81—124.1 **8 Claims**

1. A socket wrench having automatic nut ejector capability and comprising:

A. a tubular sleeve surrounding a longitudinally extending central sleeve-axis and having a front-end and a rear-end respectively substantially perpendicular to said sleeve—axis, said tubular sleeve having an internal-wall having a finite-length extending leadwardly from rear-end to front-end and including four consecutively longitudinally extending length portions along said finite-length as follows:

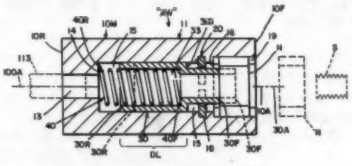
Ai. a fitting-length commencing at the sleeve rear-end and having a noncircular cross-sectional shape whereby the socket wrench sleeve might be removably mounted to a selectable socket driving means,

Aii. a relatively lengthy medial-length commencing at the forward terminus of the fitting-length and having a cross-sectional shape that is larger than that for the fitting-length whereby an abrupt sleeve-shoulder surrounding the sleeve-axis exists at the juncture of the fitting-length and the medial-length, said medial-length providing the major proportion of the sleeve internal-wall finite-length,

Aiii. a fastener-length commencing at the forward terminus of the medial-length, said fastener-length at the sleeve-front-end being of regular polygonal cross-sectional shape whereby the socket wrench sleeve might grip a polygonal nut fastener for disengagement from a threaded stud therefor, and

Aiv. a groove-length interrupting a minor proportion of said medial-length nearer the fastener-length than to the fitting-length, said groove-length circularly surrounding the sleeve-axis and having a circularly cross-sectional size larger than that for the medial-length;

B. a hollow plunger surrounding a longitudinally extending central plunger-axis that is superimposable along said sleeve-axis and having a forward lead-end and a rearward trail-end respectively substantially perpendicular to said



plunger-axis, said lead-end and trail-end defining therebetween a plunger given-length that is less than the sleeve internal-wall finite-length,

Bi. said plunger having an outside-wall extending from lead-end to trail-end, said plunger outside-wall including a lengthier and relatively cross-sectionally enlarged trail-length surrounding the plunger-axis and being longitudinally slidably engaged along a major proportion of the sleeve internal-wall medial-length rearwardly of the groove-length, said plunger outside-wall also including a shorter and necked lead-length surrounded by the sleeve groove-length and terminating at the plunger lead-end, said plunger lead-length being sufficiently longitudinally arrested with respect to the groove-length that the plunger lead-end is permanently rearwardly recessed from the sleeve front-end, and

Bii. said hollow plunger including a lead-bore extending trailwardly from the plunger lead-end and also including a trail-bore extending longitudinally leadwardly from the plunger trail-end and being cross-sectionally larger than said lead-bore, said trail-bore leadwardly remote of the plunger trail-end including an abrupt plunger-shoulder;

C. a longitudinally rearwardly compressible helical spring surrounding the colinear sleeve-axis and plunger-axis and bearing between the sleeve-shoulder and the plunger-shoulder and resiliently yieldably urging the plunger enlarged trail-length toward the sleeve internal-wall groove-length;

D. a C-shaped retainer seated within the sleeve groove-length and having a substantially fully-closed circular shape wherein the inside-opening area thereof is less than the cross-sectional area for the sleeve internal-wall medi-

al-length and is intermediate in cross-sectional size to that for the plunger outside-wall trail-length and lead-length whereby the C-shaped retainer maintains the cross-sectionally enlarged trail-length permanently trailwardly thereof and the plunger lead-end leadwardly thereof for nut ejecting capability; and

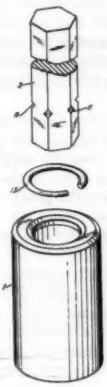
E. nut impact prevention means for preventing a said disengaged nut fastener from impacting trailwardly against the C-shaped retainer immediately prior to the nut being leadwardly ejected from the sleeve fastener-length by the resiliently longitudinally movable plunger.

4,535,658

SOCKET BIT HOLDER

Paul J. Molinari, Manchester, Conn., assignor to Allen Manufacturing Company, Bloomfield, Conn.

Filed Mar. 5, 1982, Ser. No. 354,137
Int. Cl.³ B25B *23/16*
U.S. Cl. 81—177.85 **3 Claims**



1. A socket bit holder comprising a socket member having a circumferential groove near one end of a tool bit opening formed in the socket member, said groove having a 45° surface tapering toward the end of the socket member, a tool bit adapted for insertion in the tool bit opening, a plurality of notches formed on the tool bit which notches are arranged to be adjacent the circumferential groove when the tool bit is in the socket member, and a resilient ring means positioned in the circumferential groove which ring is arranged to engage the tool bit notches.

4,535,659

TORQUE LIMITING WRENCH WITH AN AUDIO ALARM

Tai-Her Yang, 5-1 Tay Pyng St., Shi Hwu Jenn, Jang Huah Shiann, Taiwan

Filed Nov. 2, 1983, Ser. No. 547,922
Int. Cl.³ B25B *23/142*
U.S. Cl. 81—478 **13 Claims**

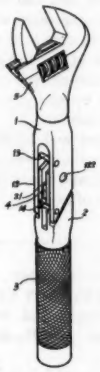
1. A torque wrench for limiting the magnitude of torque applied to a load comprising:

a fore-section rod having a head structure of a wrench at a first end thereof and a fore-section member at a second end thereof, said fore-section member forming two prongs having opposing spaced prestress coupling faces on the interior thereof defining a cavity, and exterior faces,

a rear-section rod having a rear-section member,

pivot means for connecting said fore-section member to said rear-section member, and for permitting pivoting of said rods,

said rear-section rod having upper and lower ends, said rear-section member at said upper end forming two flanges having interior surfaces on the interior sides of said flanges, and prestress coupling surfaces on the exterior sides of said flanges, said flanges received in said cavity with said prestress coupling surfaces in engagement with said prestress coupling faces of said prongs, one of said prestress coupling surfaces having indentations in an arc-shaped pattern,



a position audio alarm means for making an audible sound when said rods pivot, in which a protrusion means for restricting the pivoting of said rods on one of said prestress coupling faces of said fore-section member is received by one of said indentations on said rear-section member, and

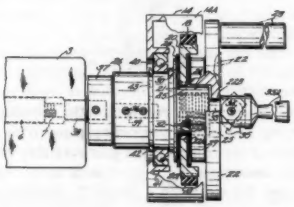
means for varying the amount of restriction provided by said protrusion means.

4,535,660

LATHE TAILSTOCK DRIVE ATTACHMENT

Daniel E. Osterman, Springfield, Oreg., assignor to Pesiri Enterprises, Inc., Springfield, Oreg.

Filed Jun. 7, 1983, Ser. No. 501,930
Int. Cl.³ B23B *23/00;* F16D *13/54, 21/00;* F16H *37/06*
U.S. Cl. 82—31 **4 Claims**



1. An attachment for the tailstock of a machine lathe to advance a tool carried by the tailstock feed screw, said attachment comprising,

mounting means for securement to the tailstock,

a variable speed reversible electric motor and speed reduction means carried by said mounting means, said speed reduction means having an output shaft,

power transmission means including a toothed timing belt powered by said output shaft and including a driven component,

a powered rotary member for coupling to the feed screw of

the tailstock and driveable by said driven component of the power transmission means,

clutch means coupling said driven component of the power transmission means and said powered rotary member, said clutch means including an axially positionable handwheel, friction discs, a manually attached cam lock serving to engage said handwheel with said driven component and the latter with said powered rotary member to drive the tailstock feed screw, said cam lock including a threaded stud in threaded engagement with said powered rotary member whereby the cam lock may be adjusted for wear by manual rotation of the threaded stud, said cam lock being of the over center type and including a post, said handwheel carried by said post and axially positionable therealong by said cam lock,

a motor speed control and a double pole-double throw switch in circuit with a power source and said motor to control motor speed and hence the rotational speed of the feed screw and rate of axial displacement of a tool carried by said tailstock.

4,535,661

POWER-DRIVEN STEADY REST FOR LATHES

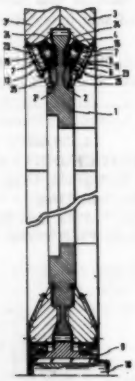
Hermann Berbalk, Göppingen, Fed. Rep. of Germany, assignor to Oerlikon-Boehringer GmbH, Goppingen, Fed. Rep. of Germany

Filed Dec. 8, 1983, Ser. No. 559,415

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245790

Int. Cl.³ B23B *5/22*

U.S. Cl. 82—40 R **12 Claims**



1. In a power driven steady rest for a lathe, especially for a crankshaft turning machine: a supporting plate to be fastened to a machine bed of the lathe; a drive gear rotatably supported in said plate for encompassing a workpiece to be machined, and having means for receiving a chuck for holding a workpiece; said drive gear having an axis; means drive said driving gear; and bearing means rotatably supporting said gear on opposite sides adjacent its outer circumference in said supporting plate, said bearing means comprising two sets consisting of a plurality of individual roller bearings respectively on opposite sides of said drive gear; the roller bearings of each set being closely spaced with respect to each other and extending around a major part of the circumference of the drive gear; each of said bearings being formed by a roller and a roller holder fastened to said supporting plate, the rollers having axes at an oblique angle to the axis of the drive gear, and having obliquely angled races disposed on the supporting plate and on the drive gear.

4,535,662

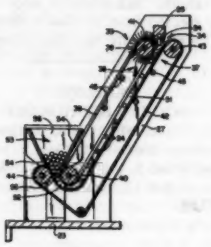
METHOD AND APPARATUS FOR GATHERING BEVERAGE STRAWS AND THE LIKE

Homer S. Lynn, 5300 Dublin Rd., Dublin, Ohio 43017

Filed Mar. 12, 1984, Ser. No. 588,779

Int. Cl.³ B26D *3/16*

U.S. Cl. 83—23 **6 Claims**



6. The method of gathering an axially extending tubular beverage stem from a cutting mechanism that severs said stem from an axially advancing elongated supply, said method comprising:

(a) advancing the stem into a substantially stationary guide disposed downstream of said cutting mechanism;

(b) severing the stem from the supply while a substantial portion of said stem is in the guide;

(c) brushing the stem from the guide into an adjacent entrant portion of a stem-transporting run defined by at least two relatively aligned belts after said stem is severed from the supply;

(d) maintaining substantially constant contact with the stem as it is brushed from the guide into the entrant portion of said stem-transporting run; and

(e) forcing the stem into a collecting station having a relatively restricted stem receiving opening extending into a discharge portion of the stem-transporting run.

4,535,663

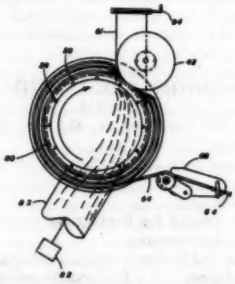
APPARATUS FOR REMOVING CUT STAPLE

James B. Shealy, Irmo, S.C., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 2, 1983, Ser. No. 500,610

Int. Cl.³ D01G *1/04*

U.S. Cl. 83—100 **4 Claims**



1. In an apparatus for cutting filamentary material into predetermined lengths comprising a cutting assembly including a plurality of knife edges secured to a reel having a mounting member and having means adapted to receive successive wrappings of filamentary material to be cut in contact with the plurality of knife edges and means for forcing said material in

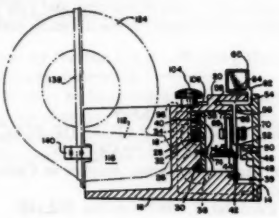
contact with the knife edges to thereby sever the material and force it between adjacent knife edges to a doffing point, the improvement comprising means for removing the severed material, said means comprising: (a) a tub connected to the mounting member, the ratio of the cutter reel diameter to the depth of the tub ranging from 0.85–4.8 to 1; (b) means for creating an air flow across the tub adjacent to and beneath the doff point and cutter reel, parallel to the plane of the cutter reel, to a collection point, said means for creating an air flow comprising means for communicating with an air source, said means delivering air from the air source to said tub adjacent to the contact point of said filamentary material and the means for forcing the filamentary material in contact with the knife edges, responsive to the suction induced by a fan through a duct in communication with said tub.

4,535,664

DISPENSER MEANS FOR ROLLED SHEET MATERIALS

Gary E. Raymond, 755 S. Rainbow Dr., Hollywood, Fla. 33021

Continuation of Ser. No. 415,656, Sep. 7, 1982, Pat. No. 4,455,905. This application Jun. 21, 1984, Ser. No. 623,233
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.³ B65H *75/32*
U.S. Cl. 83—162 **2 Claims**



1. Dispenser means for rolled sheet materials, such as negative stock, emulsified paper, and like photographic supplies, comprising:

a housing having an outer wall with a materials-discharging slot formed therein;

said housing further having first means comprising nipping rollers therewithin operative (a) for grasping an end of rolled sheet material, and (b) for moving any selective lengths of such sheet material through said housing along a given pathway into said slot;

said housing also having second means therewithin, and interposed intermediate said rollers and said slot, operative for (a) gripping sheet material disposed in said pathway, and (b) severing such aforesaid selective lengths of such gripped sheet material; wherein

said first and second means each has a means (a) manipulatable for, and (b) requiring manipulation for, effecting operation thereof independent of operation of the other thereof, whereby said first means is manipulatably operative for moving arbitrarily chosen lengths of such sheet material along said pathway, and said second means is manipulatably operative for severing such chosen lengths; and

said housing further having a channel for nestably receiving therewithin only a sheet material-discharging portion of a sheet material cassette; wherein

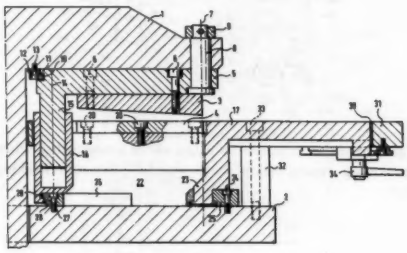
said channel is defined by substantially parallel, spaced-apart end walls, and substantially parallel, spaced-apart upper and lower or side walls, forming a substantially rectilinear frame, having a given depth, for light-sealingly nesting therewithin such sheet material-discharging portion of a sheet material cassette.

4,535,665

NOTCHING MACHINE

Harald Fazis, Weil, Fed. Rep. of Germany, assignor to Ludwig Boschert GmbH & Co., KG, Lorrach-Hauingen, Fed. Rep. of Germany

Filed Sep. 6, 1983, Ser. No. 529,551
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1982, 3233208
Int. Cl.³ B21D *28/02*
U.S. Cl. 83—556 **12 Claims**



1. A notching machine having a vertically moving ram which is provided with a projecting head serving as a tool holder for an upper knife of a blade assembly which further comprises a lower knife that is attached to a machine table, the upper and the lower knives each being provided at a nose formed by two included cutting edges with an identical fixed minimum vertex, comprising:

an upper set collar for mounting said upper knife to the head of said ram with such an attachment that the upper set collar in common with the upper knife may be turned around a vertical axis of rotation which is in parallel with the longitudinal axis of said ram and extends near the nose of the upper knife;

a lower set collar for mounting said lower knife to the machine table with such an attachment that the lower set collar in common with the lower knife may be turned around said vertical axis of rotation which extends near the nose of the lower knife, said lower set collar further for serving as an auxiliary supporting table for a work piece; and

means along an axis parallel to said vertical axis of rotation for rigidly connecting the upper set collar with the lower set collar for a common turning of the two knives about their vertical axis of rotation, wherein a notching of said workpiece with a notching angle greater than said fixed minimum vertex of the two knives is accomplished by two successive working strokes of the ram made at two respectively different turning positions of the upper and lower set collars as successively and simultaneously adjusted relative to the workpiece.

4,535,666

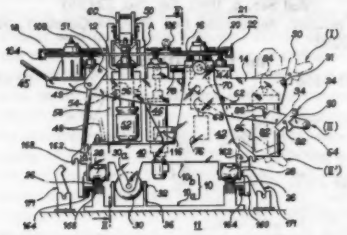
BAND SAW

Robert Fiori, Connaux; Philippe Seyfried, and José Symard, both of Bagnols sur Ceze, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 18, 1983, Ser. No. 495,935
Claims priority, application France, May 18, 1982, 82 08702
Int. Cl.³ B23D *53/04*
U.S. Cl. 83—795 **9 Claims**

1. A band saw comprising a plate supporting the workpiece to be sawn, a closed saw blade defining a cutting plane and supported by at least two wheels, one of which is a leading wheel rotated by control means, the saw also having means for moving the saw blade in relation to the workpiece to be sawn in the cutting plane, wherein the saw also comprises blade-tensioning means enabling at least one of the wheels to be moved

between a tensioning position and an action-taking position, and a detachable casing which receives such blade, the casing and the blade which it contains forming an assembly which can



be interchanged as a unit without any other demounting when the tensioning means retain such wheel in the action-taking position.

4,535,667

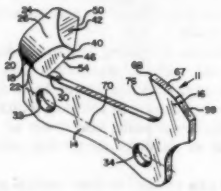
SAW CHAIN

Duane M. Gibson, Milwaukie, and Lewis A. Scott, Lake Oswego, both of Oreg., assignors to Omark Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 329,593, Dec. 10, 1981, abandoned, Continuation of Ser. No. 36,842, Aug. 7, 1979, abandoned. This application Dec. 22, 1982, Ser. No. 452,092

Int. Cl.³ B27B *33/14*

U.S. Cl. 83—830 **21 Claims**



1. A cutter for an endless cutting device movable along an endless path in a forward direction for cutting a kerf in material such as wood, said cutter in an upright position having forward and rearward ends with respect to said direction comprising:

a body portion disposed in a predetermined vertical plane,

a side plate portion joined to said body portion and extending upwardly from and positioned to one side of said body portion, said side plate portion, from front to rear thereof, sloping inwardly at an acute angle with respect to said plane,

said side plate portion adjacent its forward end having an outer surface, an inner surface, and an outwardly facing sharpenable work engaging forward end surface intersecting said inner surface at an acute angle to define a forward side cutting edge on said side plate portion, and

a top plate portion integral with and extending inwardly from an upper part of said side plate portion, said top plate portion, from front to rear thereof, sloping downwardly,

said top plate portion having an upper surface, a lower surface, and an upwardly facing sharpenable forward end surface intersecting said lower surface of said top plate portion at an acute angle to define a forward top cutting edge for said top plate portion, said cutting edge functioning to cut and lift material from the kerf being cut.

4,535,668

MAGNETIC PICKUP FOR STRINGED INSTRUMENTS

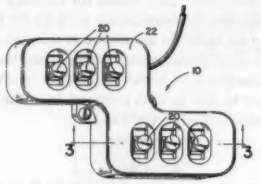
Helmut F. K. Schaller, Kuckucksweg 16, Feucht 1, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,813

Claims priority, application Fed. Rep. of Germany,

Int. Cl.³ G10H *3/18*

U.S. Cl. 84—1.15 **6 Claims**



1. A magnetic pickup for use with guitars or other musical instruments having ferro-magnetic strings, said pickup comprising a magnet adapted to underlie at least one string of an instrument and having opposite poles displaced from one another along the length of such a string when said pickup is attached to an instrument, a coil surrounding said magnet, and a pole piece located between said magnet and said string when said pickup is attached to said instrument, said pole piece being movable relative to said magnet in the direction parallel to said string.

4,535,669

TOUCH RESPONSE APPARATUS FOR ELECTRONIC MUSICAL APPARATUS

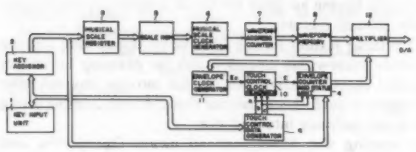
Youji Kaneko, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Shinjuku, Japan

Filed Jul. 8, 1983, Ser. No. 512,143

Claims priority, application Japan, Jul. 13, 1982, 57-120551; Jul. 13, 1982, 57-120552; Jul. 13, 1982, 57-120553

Int. Cl.³ G10H *1/057*

U.S. Cl. 84—1.26 **19 Claims**



1. A touch response apparatus for an electronic musical instrument comprising:

a touch data generating means for generating touch data as a function of a depression status of a key, an envelope count means for counting a clock signal to generate an envelope data,

a setting means for establishing a reached value of count value of said envelope count means in accordance with said touch data generated by said touch data generating means,

a relative value data generating means for generating a relative value data of a present value data of said envelope data generated by said envelope count means relative to said reached value data, and

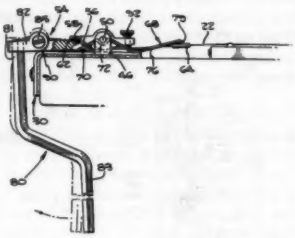
a control means coupled to said relative value data generating means for controlling a count rate of said envelope count means in accordance with said relative value data, thereby effecting a count of said envelope count means in an exponential manner.

4,535,670

STRING BENDER ATTACHMENT CONSTRUCTION

David J. Borisoff, 7726 Burnet Ave., Van Nuys, Calif. 91405

Filed May 15, 1984, Ser. No. 610,553
Int. Cl.[3] G10D *3/14*
U.S. Cl. 84—312 R 2 Claims



1. A string bender for mounting on a stringed instrument of the guitar family having a set of tensioned strings and adapted to be carried by a performer in use with the strings lying adjacent to the forwardly directed face of the instrument, said device comprising:

a bracket adapted to be mounted on a guitar at its lower end including means anchoring a selected one of the tensioned strings;

means carried by the bracket for changing the tension imposed on the selected string;

and means actuable by body movement of the performer for actuating the changing means, said actuating means including an arm mounted on the bracket and projecting rearwardly from the lower end of the guitar.

4,535,671

STICK TYPE DRUMSTICK

Paul C. Stromberg, 2417 Clinton Ave. South, Minneapolis, Minn. 55404, and Van A. Luoma, 2800 West 42nd St., Minneapolis, Minn. 55410

Filed Aug. 6, 1984, Ser. No. 637,762
Int. Cl.[3] G10D *13/02*
U.S. Cl. 84—422 S 19 Claims

1. A stick type drumstick comprising:

a plurality of elongated, substantially straight wooden rods disposed to form a bundle, said bundle having two ends and a longitudinal axis;

first retaining means securing said bundle tightly together in a band-like manner for a relatively short longitudinal span at a location spaced from but closer to the playing end thereof; and

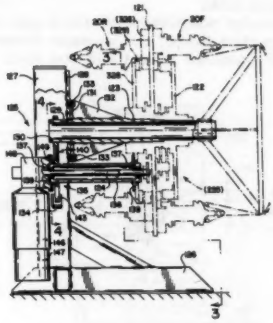
second retaining means securing said bundle together at the handle end thereof.

4,535,672

APPARATUS FOR MOUNTING COMPONENTS FOR ROTATION OF CARRIERS FOR STRAND SUPPLY BOBBINS AND FOR TIMING STRAND MOVEMENT RELATIVE TO ROTATION

Jeffrey F. Bull, Akron, and Michael E. Winiasz, Lorain, both of Ohio, assignors to James F. Karg, Akron, Ohio

Filed Nov. 20, 1984, Ser. No. 673,382
Int. Cl.[3] D04C *3/06, 3/24, 3/40*
U.S. Cl. 87—29 5 Claims



1. In a braiding machine having a set of rear carriers for a strand supply bobbin mounted on the rear side of a first table for rotation in one direction, a set of front carriers for a strand supply bobbin movable around the front side of said first table for rotation by a second table in the opposite direction, a central axis stationary shaft for rotatable mounting of said first and second tables thereon, and a power input shaft for connection to a drive mechanism for rotating said first and second tables in opposite directions, a mounting assembly for said central axis stationary shaft and said power input shaft, said mounting assembly comprising: a frame base; a vertically extending frame stanchion carried by said frame base and having an upper end for attachment of the rear end of said central axis stationary shaft; said frame stanchion further having a medial lattice opening below said upper end; a drive torque tube extending from within said frame stanchion medial lattice opening and substantially parallel to said central axis stationary shaft and toward the rear side of said first table, said torque tube housing and rotatably mounting said power input shaft; and, an arcuately adjustable means projecting into said frame stanchion medial lattice opening for support of the rear end of said drive torque tube.

4,535,673

APPARATUS FOR ROTATION OF CARRIERS FOR A STRAND SUPPLY BOBBIN

Michael E. Winiasz, Lorain, Ohio, assignor to James F. Karg, Akron, Ohio

Filed Nov. 20, 1984, Ser. No. 673,383
Int. Cl.[3] D04C *3/06, 3/24, 3/38, 3/40*
U.S. Cl. 87—29 4 Claims

1. In a braiding machine having a set of rear carriers for a strand supply bobbin mounted on the rear side of a first table for rotation in one direction, a set of front carriers for a strand supply bobbin movable around the front side of said first table for rotation by a second table in the opposite direction, a central axis stationary shaft for rotatable mounting of said first and second tables thereon, a drive mechanism power input shaft extending substantially parallel to said stationary shaft and toward the rear side of said first table, and a frame base carrying a vertically oriented frame stanchion for mounting said stationary shaft and said power input shaft, a drive mechanism

for rotating said first and second tables in opposite directions, said table drive mechanism comprising:

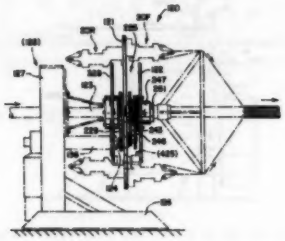
a first sprocket mounted on the forward end of said power input shaft and behind the rear side of said first table;

a second sprocket positioned around said stationary shaft and aligned with said first sprocket and coupled to said first table;

a first chain means connecting said first sprocket with said second sprocket whereby a rotation of said power input shaft will rotate said first table in one direction;

a post shaft extending from the front side of said first table substantially parallel to said stationary shaft and toward said second table;

a third sprocket positioned around said post shaft on the medial portion thereof and rotatable thereon; a fourth sprocket positioned around said post shaft on the end



thereof and coupled to said third sprocket for rotation thereof;

a fifth sprocket positioned around said stationary shaft and coupled thereto and aligned with said third sprocket;

a second chain means connecting said third sprocket with said fifth sprocket whereby said third sprocket is rotated in a second direction during rotation of said first table in the opposite direction;

a sixth sprocket positioned around said stationary shaft and aligned with said fourth sprocket and coupled to said second table; and,

a third chain means connecting said fourth sprocket with said sixth sprocket whereby said fourth sprocket, coupled to said third sprocket, and said second table are rotated in a second direction during rotation of said first table in the opposite direction.

4,535,674

APPARATUS FOR CONTROL OF MOVING STRANDS FROM ROTATING STRAND SUPPLY BOBBINS

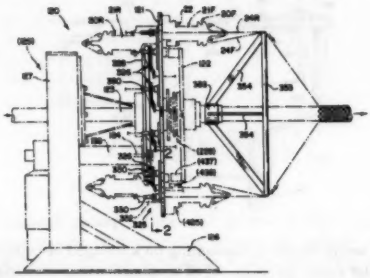
Jeffrey F. Bull, Akron; Harlan Johnson, Copley, both of Ohio; James F. Karg, 4550 Shaw Rd. Ext., Akron, Ohio 44313, and Michael E. Winiasz, Lorain, Ohio, assignors to James F. Karg, Akron, Ohio

Filed Nov. 20, 1984, Ser. No. 673,384

Int. Cl.³ D04C *3/40, 3/42*

U.S. Cl. 87—29 **8 Claims**

1. In a braiding machine having a set of rear carriers for a strand supply bobbin mounted on the rear side of a first table for rotation in one direction, the strands from a set of supply bobbins on said rear carriers passing through a set of peripheral slots in said first table, a second table in front of said first table, a set of front carriers for a strand supply bobbin mounted on and driven around the front side of said first table by rotation of said second table, a central axis stationary shaft for rotatable mounting of said first and second tables thereon, a drive mechanism for rotating said first and second tables in opposite direction, and an apparatus for control of moving strands from the sets of supply bobbins on said rear and front carriers during movement thereof around and along said central axis stationary shaft and toward the "work center" of said braiding machine, said apparatus having a set of said first table peripheral slots which are radially arcuate for movement of a set of strands from said rear carriers through an arc segment relative to the axis of said stationary shaft, said apparatus further comprising: a set of mechanisms carried on the rear side of said first table for guiding a set of strands from said rear carriers prior to movement thereof into said radially arcuate slots, each said rear strand guide mechanism being between two of said radially arcuate slots; a variable radius cam track selectively posi-



tioned behind the rear side of said first table and radially inward of said set of rear carriers, said cam track actuating and controlling said set of rear strand guide mechanisms by rotation of said first table; and, a circular braid ring mounted coaxially on said central axis stationary shaft in front of said second table and having an outer diameter substantially coincident with the axes of rotation of a set of bobbins on said front carriers.

4,535,675

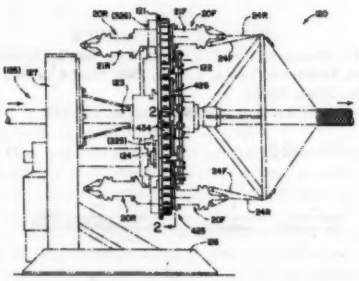
APPARATUS FOR ROTATING A SET OF CARRIERS FOR A STRAND SUPPLY BOBBIN RELATIVE TO MOVING STRANDS FROM A SET OF CONTRA-ROTATING CARRIERS FOR A STRAND SUPPLY BOBBIN

Jeffrey F. Bull; Daniel W. Karg, both of Akron, and Michael E. Winiasz, Lorain, all of Ohio, assignors to James F. Karg, Akron, Ohio

Filed Nov. 20, 1984, Ser. No. 673,385

Int. Cl.³ D04C *3/06, 3/24, 3/42*

U.S. Cl. 87—29 **3 Claims**



1. In a braiding machine having a set of rear carriers for a strand supply bobbin mounted on the rear side of a first table for rotation in one direction, the strands from a set of supply bobbins on said rear carriers passing through a set of peripheral and radially arcuate slots in said first table, a second table in front of said first table, a central axis stationary shaft for rotatable mounting of said first and second tables thereon, a drive mechanism for rotating said first and second tables in opposite directions, and an apparatus for mounting and driving a set of

front carriers for a strand supply bobbin around the front side of said first table, said apparatus comprising:

a shuttle for each said front carrier, each said shuttle having a forwardly facing platform for mounting the base of a front carrier and a rearwardly projecting segment of an arcuate slide tang having a length less than the spacing between any two of said first table arcuate slots, the radially inner side of each shuttle platform carrying a shuttle drive block having two exteriorly opening actuator slots;

a circular shuttle mounting track carried on the front side of said first table and having arcuate segments extending between any two of said first table arcuate slots and engaging said shuttle slide tangs;

a circular actuator cam track carried on the front side of said first table radially inwardly of said shuttle mounting track, said cam track following a constant diameter broken by a set of inwardly directed V's, the apex of each said cam track V being positioned radially inwardly of the inner end of one of said first table arcuate slots; and,

a shuttle drive assembly for each said front carrier mounted on the periphery of the rear side of said second table and having two symmetrical and articulated drive arms mounted on and projecting laterally from a single actuator post, each said drive arm being in confined engagement with said actuator cam track on said first table and carrying an actuator dog for articulated movement into and out of engagement with one of each said two shuttle drive block actuator slots.

4,535,676

COOLING ARRANGEMENT FOR THE GUN BARRELS OF FIREARMS

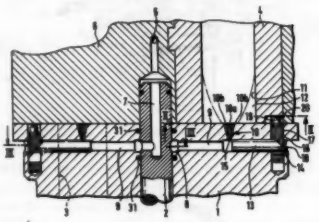
Anton Politzer, Lauf, and Roland Bertiller, Schramberg, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Oct. 7, 1982, Ser. No. 433,272

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145764

Int. Cl.³ F41F *17/14*

U.S. Cl. 89—14.1 **9 Claims**



1. In a cooling arrangement for the gun barrels of firearms, including a rotatable drum having a longitudinal axle at the rearward portion of the gun barrel provided with passageways in the drum which passageways are directed radially outwardly intermediate individual projectile chambers which passageways are joined in the region of the end portion of the gun barrel axially adjoining the drum, a main passageway for a central cooling medium infeed located in a hollow bore along the longitudinal axle of said drum, said radial passageways being connected to said main passageway; the improvement comprising: cooling medium flow nozzles extending in predetermined angular relationship with the longitudinal axis of the drum and connecting with the radially directed cooling passageways; closure members in said radial passageways automatically opening and closing only during the firing of said firearm and in dependence upon the rotational drum position, said nozzles having outlet openings located in the axial end surface of the drum facing towards the gun barrel and openly communication for a predetermined time interval with the associated end portion of the gun barrel.

4,535,677

DRUM MAGAZINE FOR LARGE-CALIBER AMMUNITION

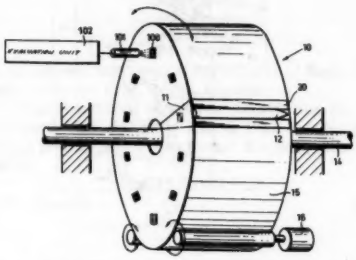
Klaus-Dieter Panhke, Hilden, and Wilfried Becker, Duesseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,452

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227214

Int. Cl.³ F41F *9/00*

U.S. Cl. 89—46 **11 Claims**



1. An improved drum magazine for large caliber ammunition having an outer peripheral cover in which at least one extraction opening is disposed and including extraction means adapted to selectively extract the outermost of a plurality of cartridges disposed in said drum magazine, the improvement comprising in combination, a plurality of ammunition chambers exchangeably mounted in said drum magazine independently from each other, each ammunition chamber defining a storage space for a plurality of radially juxtaposed cartridges.

4,535,678

HYDRAULIC CONTROL APPARATUS FOR A SERVO-MOTOR, PARTICULARLY FOR VEHICLE STEERING

Svend E. Thomsen, and Thorkild Christensen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 178,146, Aug. 14, 1980, Pat. No. 4,364,302. This application Sep. 16, 1982, Ser. No. 419,154

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1979, 2932847

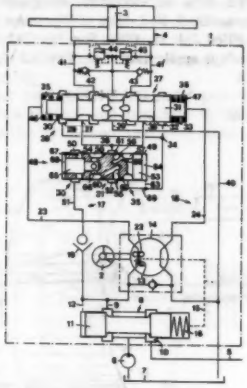
The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.³ F15B *13/042*

U.S. Cl. 91—29 **3 Claims**

1. A hydraulic steering control assembly, comprising, a bidirectional servomotor having two operating ports on opposite sides thereof, a pump and a tank, a steering wheel operated metering control unit having inlet and outlet ports and left and right control ports to which pressurized fluid may be selectively directed via a measuring motor from said inlet port and returned from the other of said control ports to said outlet port, bidirectional valve means having inlet port means and directional power control ports connected to said servomotor ports for selectively supplying and exhausting pressurized fluid therefrom, said bidirectional valve means having left and right turn control ports, a two sided control circuit connected to said metering unit control ports and to said bidirectional valve means left and right turn control ports, utility valve means having pressure regulating and control and power valve capabilities, said utility valve means having a single slidable spool disposed in a valve housing having inlet and outlet passage means, said spool and said housing forming first and second

chambers at opposite ends thereof, a power circuit connected to said pump and to said utility valve inlet means, said spool having first internal passage means having fluid communication with said first chamber and being in an adjustable throttling relationship with one of said passage means of said housing to regulate the pressure of fluid thereat, said spool having second internal passage means in constant fluid communication



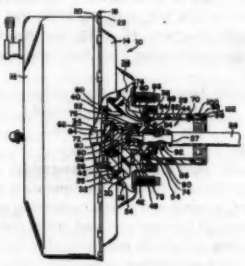
with said first internal passage means thereof and one side of said metering control unit measuring motor, fluid passage joining means for combining the fluid flow of said first and second internal passage means of said utility valve to combine pressure fluids from said control and power circuits, said fluid passage joining means providing a common path for pressurized fluids from said power and control circuits to a selected one of said servomotor ports.

4,535,679

CONTROL VALVE FOR A BRAKE BOOSTER

Oswald O. Kytta, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 2, 1981, Ser. No. 307,919
Int. Cl.³ F15B *9/10*
U.S. Cl. 91—376 R **12 Claims**



1. A control valve for use in a fluid pressure operated motor having a housing with a cavity therein separated by a wall to define first and second chambers therein, a hub connected to said wall having a projection that extends through the housing, said projection having a bore therein through which the first and second chambers are connected to each other in a first mode of operation and said first chamber is connected to a source of fluid in a second mode of operation, said control valve controlling the fluid communication through said bore in response to force applied to an input member to terminate said first mode of operation whereby a pressure differential develops across said wall and an output force is produced, said valve being characterized by:

a plunger located in said bore;

a disc having a central opening and a peripheral surface;

a retainer connected to said projection for holding said peripheral surface against a shoulder to fix the position of the disc within said bore, said retainer having an inwardly projecting lip, said plunger contacting said disc adjacent said central opening and moving the disc against said lip on the retainer during said first mode of operation and said plunger moving away from said disc during said second mode of operation to allow fluid to flow through said central opening and into said first chamber to develop said pressure differential;

a first resilient member located between said inwardly projecting lip and said input member for urging said plunger toward said disc and said lip, said lip limiting the movement of said disc toward said retainer and establish a rest position for said disc during said first mode of operation; and

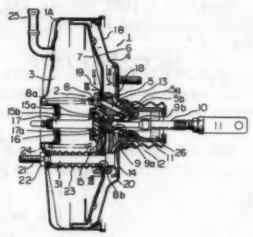
a second resilient member located between said retainer and said disc for urging said disc toward a seat during said second mode of operation to seal said second chamber from said bore.

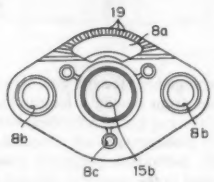
4,535,680

PNEUMATIC SERVO BOOSTER

Toshio Takayama, Kanagawa; Hiromi Ando, Tokyo, and Mitsuhiro Endou, Kanagawa, all of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Dec. 28, 1983, Ser. No. 566,385
Claims priority, application Japan, Jan. 10, 1983, 58-1906
Int. Cl.³ F15B *9/10*
U.S. Cl. 91—376 R **5 Claims**





1. In a pneumatic servo booster of the type including a housing, a power piston unit partitioning the interior of said housing into front and rear chambers and having therein a generally longitudinally extending first passage having a first end communicated with said front chamber and a second end communicated with the interior of said power piston unit, and a generally radially extending second passage having a first end communicated with said rear chamber and a second end communicated with said interior of said power piston unit, a valve mechanism provided in said interior of the power piston unit

and being associated with an input rod to control the communication between said first and second passages and between said second passage and another passage which is communicated with a source of a first reference pressure, said front chamber being communicated with a source of a second reference pressure which is lower than said first reference pressure, and an output rod connected to said power piston unit, the improvement wherein said power piston unit comprises:

a power piston main body;

a cover member secured to said power piston main body and covering said first end of said first passage; and

a plurality of diversion channel means, provided between adjacent surfaces of said cover member and said power piston main body and extending radially outwardly from the periphery of said first end of said first passage and through said cover member, for communicating said first passage with said front chamber and for reducing noise caused by fluid passing from said first passage into said front chamber.

4,535,681

FLUID OPERATED TRANSMISSION CONTROL SYSTEM

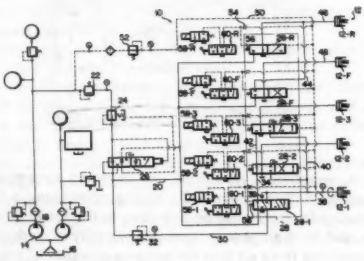
Masaru Nakamura, Matsuto, and Takashi Kuse, Komatsu, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,479

Claims priority, application Japan, May 31, 1983, 58-081047; May 31, 1983, 58-081048; May 31, 1983, 58-094878; May 31, 1983, 58-094880

Int. Cl.³ F15B *11/16, 13/06*

U.S. Cl. 91—527 **8 Claims**



1. A fluid operated transmission control system comprising:

(a) a source of fluid under pressure;

(b) a first group of fluid actuated drive establishing devices to be selectively actuated by the pressurized fluid from the source for selecting a drive speed;

(c) a second group of fluid actuated drive establishing devices to be selectively actuated by the pressurized fluid from the source for selecting a drive direction;

(d) a plurality of speed select valves, associated one with each of the first group of drive establishing devices, to be pilot operated individually for directing the pressurized fluid from the source to the associated ones of the first group of drive establishing devices;

(e) a plurality of direction select valves, associated one with each of the second group of drive establishing devices, to be pilot operated individually for directing the pressurized fluid from the source to the associated ones of the second group of drive establishing devices;

(f) a plurality of speed select control valves, associated one with each speed select valve, to be electrically actuated individually for pilot operating the associated speed select valves to cause the same to direct the pressurized fluid to the associated ones of the first group of drive establishing devices;

(g) a plurality of direction select control valves, associated one with each direction select valve, to be electrically actuated individually for pilot operating the associated direction select valves to cause the same to direct the pressurized fluid to the associated ones of the second group of drive establishing devices; and

(h) a plurality of emergency control valves interposed one between each of the speed select control valves and direction select control valves and the associated one of the speed select valves and direction select valves, each emergency control valve being operated manually upon malfunctioning of the associated one of the speed select control valves and direction select control valves to actuate or deactuate the associated one of the first and second groups of drive establishing devices via the associated one of the speed select valves and direction select valves.

4,535,682

PISTONS

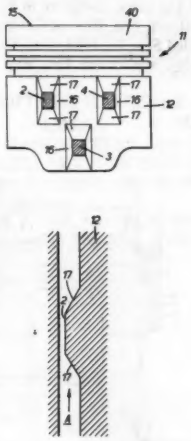
John G. Collyear, and David A. Parker, both of Rugby, England, assignors to AE PLC, Rugby, England

Continuation-in-part of Ser. No. 305,990, Sep. 28, 1981, abandoned. This application Aug. 6, 1982, Ser. No. 406,099

Claims priority, application United Kingdom, Aug. 11, 1981, 8124473

Int. Cl.³ F16J *9/20*

U.S. Cl. 92—153 **47 Claims**



1. A piston for reciprocation in a cylinder of an internal combustion engine wherein lubrication with an associated cylinder is provided by an oil film, comprising

a crown,

a gudgeon pin bore,

a ring belt,

a first generally cylindrical skirt portion to one side of a plane including the piston axis and the gudgeon pin bore axis,

a second generally cylindrical skirt portion to the other side of said plane,

said skirt portions being attached to the ring belt,

a small number of discrete bearing surfaces formed on the first and second skirt portions,

each of said skirt portions having an associated one of said skirt portions therearound and being spaced radially outwardly of the associated one of said skirt portions by a small distance,

a circumferentially extending front edge to each bearing surface,

a circumferentially extending rear edge to each bearing surface,

generally axially extending side edges interconnecting the front and rear edges of each bearing surface,

a shallow hydrodynamic ramp connecting each said circumferential front edge to the surrounding skirt portion, the end of said ramp remote from the associated bearing surface being spaced from the surface in a radial direction by less than 125 microns.

a shallow hydrodynamic ramp connecting each said circumferential rear edge to the surrounding skirt portion, the end of said ramp remote from the associated bearing surface being spaced from the surface in a radial direction by less than 125 microns, the surrounding skirt portions providing retained oil said small distance from said bearing surfaces and said ramps co-operating with the cylinder to force a thin oil film over the bearing surfaces during motion of the piston relative to the cylinder to hydrodynamically lubricate said bearing surfaces as the bearing surfaces transmit lateral thrust from the piston to the co-operating cylinder.

4,535,683

PISTON WITH A MEMBER MADE OF PARTIALLY STABILIZED ZIRCONIUM OXIDE

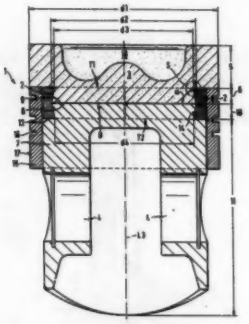
Ulf Dworak, Baltmannsweiler; Hans Olapinski, Aichwald; Dieter Fingerle, Hochdorf, and Ulrich Krohn, Leonberg, all of Fed. Rep. of Germany, assignors to Feldmuhle Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 27, 1983, Ser. No. 536,214

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237469

Int. Cl.³ F02F *3/12*; F16J *1/01*

U.S. Cl. 92—224 **11 Claims**



1. A piston arrangement comprising: a metal shaft and a piston head of zirconium oxide attached to said shaft; the entire cross-section of the top of said piston head facing a combustion chamber and comprising said zirconium oxide; said piston head having a bottom shaped as a truncated cone with a first base diameter contacting said shaft at a plane, said cone having a second base diameter at a transition into the top of said piston head, said first diameter being longer than said second diameter; an annular element surrounding substantially the truncoconicular bottom of said piston head, said annular element having separate sections, said annular element having an inside contour matching said truncated cone at the bottom of said piston head, wherein the improvement comprises:

(a) said zirconium oxide being partially stabilized;

(b) said shaft having a top in the form of a truncated cone with a first base diameter contacting the base of said piston head at said plane and being substantially equal to the diameter of said base of said piston head, said shaft having a cylindrically-shaped section substantially below the truncoconicular top, said shaft having a diameter shorter at the transition from its truncoconicular top to said cylindrical section below thereof than the diameter of the base of the truncoconicular bottom of said piston head;

(c) said annular element having an inside contour surrounding and matching the truncoconical top of said shaft;

(d) said annular element being secured with a shrink ring, surrounding said annular element;

(e) said shrink ring stressing said annular element for inducing compression strain in said truncoconicular bottom of said piston head to counteract thermally induced critical tangential tensile stresses.

4,535,684

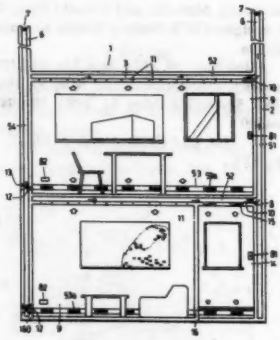
VENTILATION SYSTEM FOR AN ENCLOSED SPACE

Guu Perng, No. 15, Lane 129, Kee-Chin 1 Rd., Kee Lung City, Taiwan

Filed Aug. 22, 1984, Ser. No. 643,052

Int. Cl.³ F24F *7/00*

U.S. Cl. 98—31 **8 Claims**



1. A ventilation system for an enclosed occupied space defined by hollow walls and a ceiling comprising a fresh air inlet and a fresh air passage provided in the lower side of the walls, said fresh air passage having a plurality of fresh air outlet for supplying fresh air into the space, a plurality of exhaust air inlets provided in the ceiling of the space, a first exhaust air discharge passage communicated with said exhaust air inlets and lying in the ceiling, a second exhaust air discharge passage communicated with said first discharge passage and lying in the wall, an exhaust air outlet at the top of said second exhaust air passage, means for preventing backdraft at the exhaust air outlet, said means including a roof-shaped member having a first and a second flow regulating arrangement each of which has a plurality of overlapping slats for opening and closing said air outlet, the first and second flow regulating arrangement being so arranged that when one of them is fully closed, the other will be fully opened.

4,535,685

AIR OUTLET FOR AIR CONDITIONING SYSTEMS

Rolf Reuter, Essen, Fed. Rep. of Germany, assignor to Maurmann Ingenieurbüro GmbH, Heiligenhaus, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 586,061

Int. Cl.³ F24F *13/06*

U.S. Cl. 98—40.12 **3 Claims**

1. An air outlet device for air conditioning systems comprising:

(a) a housing,

(b) air guide blade means closing the housing on one side

thereof and having air guide blades extending obliquely outwards, said air guide blade means including peripheral portions and central portions,

(c) a partition in said housing, said partion subdividing said housing into an inlet chamber and a second chamber which is limited by said air guide blade means,

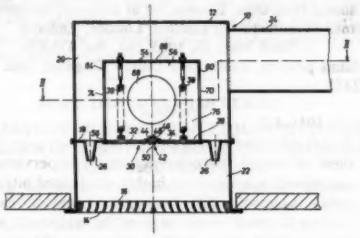
(d) an air inlet port in said housing, said air inlet port communicating with said inlet chamber,

(e) a ring of air outlet nozzles provided in said partition and directed towards said peripheral portions of said air guide blade means,

(f) a central passage in said partition opposite said central portions of said air guide blade means, and

(g) spring-loaded flap means for controlling the air flow through said central passage,

characterized in that



(h) said spring-loaded flap means comprise a flap assembly of pivotably mounted flaps which governs said central passage,

(i) said flaps are pivotable from a closed position into said second chamber to open said passage,

(j) springs are provided acting on said flaps to urge them towards said closed position,

(k) an intermediate housing is provided in said inlet chamber, said intermediate housing being open towards said partition and thereby forming an edge, said edge being attached to said partition around said passage,

(l) said intermediate housing has apertures therethrough, through which said inlet chamber communicates with said passage, and has an end face opposite said passage, and

(m) said springs are tension springs, each having one end attached to one of said flaps and having its other end attached to said end face.

4,535,686

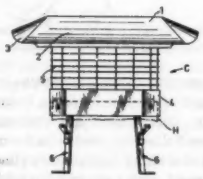
CHIMNEY CAP

Durward A. Hisey, St. Louis County, Mo., assignor to Hy-C Company, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 545,229, Oct. 25, 1983, which is a division of Ser. No. 357,733, Mar. 12, 1982, Pat. No. 4,436,021. This application Mar. 12, 1984, Ser. No. 588,746

Int. Cl.³ F23L *17/02*

U.S. Cl. 98—67 **6 Claims**



1. In a chimney cap for use in providing coverage for the upper end of the formed chimney flue and thereby preventing the entrance of any extraneous elements therein, comprising, a cover means provided upwardly of the flue and preventing the entrance of rain or other elements downwardly into the chimney flue, a band means arranged downwardly of the said cover means and designed for proximity fitting upon the said chimney flue, said cover means and band means being spaced apart a distance heightwise to allow sufficient draft to develop and remove smoke and fumes from the chimney flue, a foraminous means arranged connecting with both the said cover means and band means and disposed for spanning the space in between the said means and arranged substantially in alignment with the said band means, retention means operatively associated with the said band means for assuring its securement with the chimney flue upon which it seats, said retention means including a series of appendages connecting with the band means and projecting downwardly therefrom for extending into and biasing against the interior of the chimney flue for securement of the cap therewith, said appendages being removable from the band means, said band means being formed having a series of sides, adjacent sides of the band means being intervened by a substantially flattened corner, there being an appendage securing with each said band means corner to assure snug securement of the chimney cap with its flue, each appendage being formed of resilient material, each appendage including a leg that removably connects with the band means, extends inwardly and then downwardly to its lowest end, said appendage being arranged for biasing against the interior of the chimney flue for securing said cap firmly in place, a support means provided with the band means at each said corner, each support means being a strap provided interiorly of the band means corner, there being a space provided between the strap and band means with the associated appendage inserting therein and being substantially aligned and contiguous with its associated band means thereat, and fastening means securing through said support means for fixing the appendate in place.

4,535,687

DEVICE FOR THE MANUFACTURE AND PROCESSING OF BISCUIT MIXTURE SHAPES

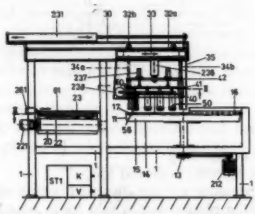
Heinz-Josef Antpöhler, Lippstädter; Strasse 68, D-4795 Delbrück, Fed. Rep. of Germany

Filed Jul. 8, 1983, Ser. No. 512,061

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226795

Int. Cl.³ A47J *37/00*

U.S. Cl. 99—334 **20 Claims**

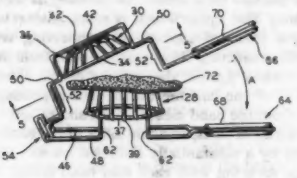


1. In a device for the manufacture of biscuit mixture shapes and for individually depositing said biscuit mixture shapes on to a band conveyor, the improvement comprising: a trough for the biscuit mixture having a floor, at least one pick up device having a forming wall defining a cylindrical forming chamber open at one end and terminating in a rim and an axial bore opening into said forming chamber at the other end thereof, drive means for moving the forming chamber into a first position wherein the rim touches the floor of the trough and into a second position wherein the rim is above the band conveyor and for rotating the pick up device axially of the forming chamber, relative to the floor when the pick up device is in the first position, and ejector means coactive with the axial bore for ejecting biscuit material from the forming chamber.

4,535,688
TORTILLA BASKET FRYER

Wade A. Bentson, San Francisco, Calif., assignor to Amco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 553,369, Nov. 18, 1983, Pat. No. 4,494,453. This application Jul. 23, 1984, Ser. No. 633,610
The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.
Int. Cl.³ A47J 37/12
U.S. Cl. 99—353 17 Claims

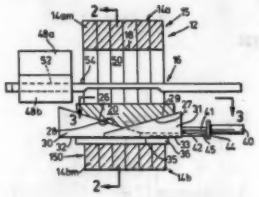


1. A device for deep frying tortillas, said device comprising a nesting pair of inner and outer wire frame baskets, defining a somewhat dish shaped space being between them to receive and mold the shape of a food product, a pair of elongated handles extending from one side of each one of the baskets, the handle on at least the inner one of the basket being shaped to form a vertical stand for supporting and holding at least one side of said inner basket in a stable and inverted position to facilitate a loading and unloading of said food product in said dish shaped space.

4,535,689
PRESS WITH WEDGE

Ladislao W. Putkowski, 2350 Bridletown Cir., Unit 1710, Scarborough, Ontario M1W 3E6, Canada

Filed Aug. 22, 1983, Ser. No. 525,519
Claims priority, application Canada, Aug. 25, 1982, 410056
Int. Cl.³ B30B 1/40
U.S. Cl. 100—214 20 Claims



1. A press comprising:
(a) a frame forming a closed loop;
(b) a first pressure surface disposed within said loop;
(c) a movable platen within said loop, which has a second pressure surface opposed to and spaced from said first pressure surface to permit the introduction between said first and second pressure surfaces of a structure to be compressed;
(d) means supporting said movable platen for movement thereof in a direction towards and away from said first pressure surface;
(e) wedge means acting between said frame and platen for moving the movable platen towards said first pressure surface to compress a structure disposed between said first and second pressure surfaces, said wedge means including first and second wedges which are movable in opposite directions in a plane generally at right angles to said direction of platen movement, said wedges having respective inclined surfaces which taper in opposite directions with respect to said plane and respective support surfaces which are disposed in said plane; said platen having correspondingly inclined surfaces co-operating with said inclined surfaces of the wedge means and adapted to cause movement of the movable platen towards the first pressure surface in response to inward movement of the wedges in said opposite directions; and
(f) drive means for propelling said first and second wedges in opposite directions to move said movable pressure surface; said inclined surfaces and drive means being arranged to cause said movement of the movable platen towards said first pressure surface without imparting any substantial lateral force to the movable platen.

4,535,690
DUPLICATING STENCIL

Jonathan Gestetner, London; Cyril Green, Cockfosters, and Thomas Hanrahan, London, all of England, assignors to Gestetner Manufacturing Limited, London, England

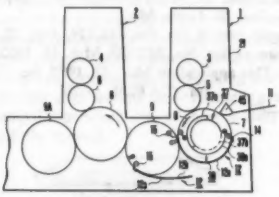
Filed Mar. 15, 1983, Ser. No. 475,623
Claims priority, application United Kingdom, Jan. 28, 1983, 8302373
Int. Cl.³ B41N 1/24; B41L 13/14
U.S. Cl. 101—127 1 Claim

1. In a duplicating stencil comprising:
a sheet of stencil tissue having an ink-impervious plastics impregnation comprising highly plasticized nitrocellulose which is capable of displacement by impact imaging,
a heading fastened to one edge of the said sheet, and
a backing sheet removably attached to said heading and adjacent to said sheet of stencil tissue,
the improvement which consists in providing the said sheet of stencil tissue in an area between the heading and the image-receiving area of the said sheet with a thin, integral reinforcement coating comprising nitrocellulose which is less highly plasticized than the ink-impervious impregnation, which coating is resistant to imaging by impact, does not substantially reduce the flexibility of the impregnated stencil tissue and which renders the stencil resistant to abrasion by the leading edge of an image-receiving paper sheet.

4,535,691
GRIPPER OPENING/CLOSING APPARATUS OF SHEET-FED ROTARY PRESS

Kenji Kida, Ibaragi, Japan, assignor to Komori Printing, Tokyo, Japan

Filed Sep. 12, 1984, Ser. No. 650,319
Int. Cl.³ B41F 5/02
U.S. Cl. 101—230 6 Claims



1. A gripper opening/closing apparatus in a sheet-fed rotary printing press, said apparatus having a broadside printing cam and a perfecting cam which are commonly brought into contact with cam followers, and which are adjacent to each other to be coaxial with an impression cylinder, and said apparatus being arranged such that, in a broadside printing mode, grippers of said impression cylinder are opened/closed by said broadside printing cam to cause a reversing gripper of a reversing cylinder to grip a leading end of a printed sheet gripped by said grippers of said impression cylinder, and that, in a perfect-

ing mode, said grippers of said impression cylinder are opened/closed by said perfecting cam and said broadside printing cam to cause said reversing grippers of said reversing cylinder to grip a trailing end of the printed sheet gripped by said grippers of said impression cylinder, wherein a central angle of said impression cylinder which is formed between a sheet gripping position where said grippers of said impression cylinder grip the sheet from a preceding stage and a transfer position where the sheet is transferred from said gripper of said impression cylinder to said reversing grippers of said reversing cylinder are set to be smaller than a remaining central angle of said impression cylinder, and wherein shapes of said broadside printing cam and said perfecting cam are determined in such a manner that, in the broadside printing mode, said perfecting cam is located in a portion of said impression cylinder which corresponds to the remaining central angle so as to set said perfecting cam away from a sheet release position of said broadside printing cam and to set said perfecting cam in an inactive state, and that, in the perfecting mode, said perfecting cam is located to be continuous with the sheet release position of said broadside printing cam.

4,535,692

APPARATUS FOR SUPPLYING LIQUID MEDIUMS TO ROLLERS OF PRINTING MACHINES UTILIZING A DISTRIBUTOR PLATE

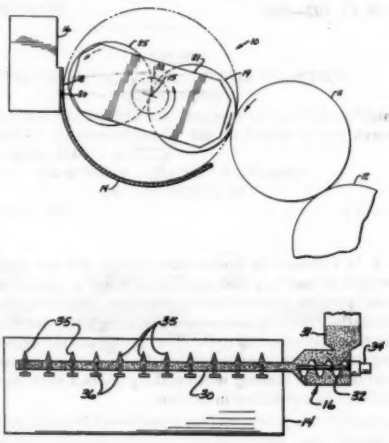
Johannes Schubert, Mainhausen, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,583

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301909

Int. Cl.³ B41F *31/00*

U.S. Cl. 101—337 **12 Claims**



1. An apparatus for supplying a liquid medium to a roller of a machine comprising an arcuate shaped distributor plate having a determined center of curvature, means for feeding a controlled quantity of said liquid medium onto said distributor plate, a feed roller, a guide rotatably supporting said feed roller, means rotatably supporting said guide for movement about the center of curvature of said distributor plate, and means for cyclically moving said guide in a path whereby said feed roller on said distributor plate to mix and uniformly spread the medium along the plate and about the periphery of said feed roller and then is moved into contact with said machine roller to transfer liquid medium thereto in a controlled manner, a smoothing roller rotatably mounted on said guide for constant rotational contact with said feed roller as it is rolled in contact with said distributor plate, and said smoothing roller having a diameter less then the diameter of said feed roller so as not to contact said distributor plate during cyclic rolling movement of said feed roller along said distributor plate.

4,535,693

DEVICE FOR DISPENSING VISCOUS MATERIALS

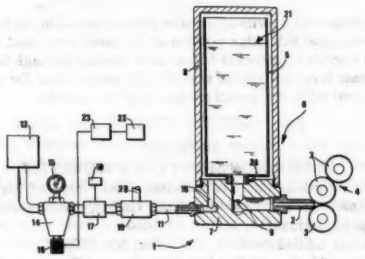
Bruno Belvederi, S. Martino di Monte S. Pietro, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Jul. 22, 1983, Ser. No. 516,326

Claims priority, application Italy, Sep. 8, 1982, 3526 A/82

Int. Cl.³ B41F *31/08*

U.S. Cl. 101—366 **3 Claims**



1. A device for dispensing viscous material, comprising:

an airtight container;

a first pipe connecting the inside of said airtight container to a nozzle for supplying the viscous material to a consumption area;

a second pipe for connecting the inside of said airtight container to a line connected, with the interposition of an air flow regulator, to a source of compressed air;

means for fixing, inside said container, a cartridge containing viscous material said cartridge having a low aperature at the bottom of said cartridge and an upper aperature located above the uppermost level of said viscous material, said low aperature being adjacent and communicating with the inlet of said first pipe said upper aperature being in communication with said second pipe, whereby, air from said second pipe forcing said viscous material through said nozzle and exiting through said nozzle when the supply of viscous material has been exhausted;

a flow control element interposed in said line and connected to an alarm device so as to set such alarm in operation upon sensing that air is passing directly from the said source to the said nozzle because said cartridge has become depleted of said viscous material.

4,535,694

LOOPED, ELONGATE LETTERPIECES PRINTING PLATE FOR USE ON ROTARY PRESSES, AND METHOD OF PREPARATION

Manabu Fukuda, 122, Takano-1 Chome, Misato-Shi, Saitama-Ken, Japan

Filed Apr. 7, 1983, Ser. No. 482,952

Claims priority, application Japan, Apr. 8, 1982, 57-57281

Int. Cl.³ G03F *7/02;* **B41N** *1/16*

U.S. Cl. 101—395 **16 Claims**

1. A letterpress printing plate for use on a rotary press of the kind having a plate cylinder for printing on paper or the like against an impression cylinder, the plate cylinder having a series of sprockets formed on its surface along at least one edge thereof, and a guide cylinder disposed in parallel spaced relation to the plate cylinder; the letterpress printing plate being in the form of an elongate, looped band of flexible materials to be

wrapped around the plate cylinder and the guide cylinder, and comprising:

(a) a base layer;

(b) a photoetched photosensitive layer attached to one face of the base layer and containing in relief both a printing

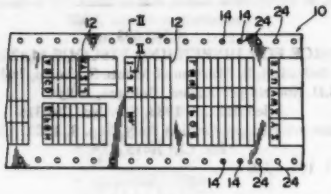


image and a series of annular projections along at least one marginal side edge portion of the base layer; and

(c) a series of sprocket holes, each formed through both the base layer and one of said annular projections, for engagement with the sprockets on the plate cylinder.

4,535,695

FUSE FOR A SPIN-TYPE PROJECTILE

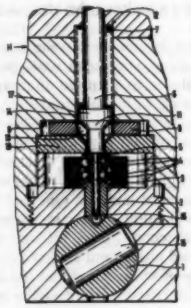
Walter Winterhalter, Tennenbronn, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,485

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244529

Int. Cl.³ F42C *15/22, 15/26*

U.S. Cl. 102—240 **10 Claims**



1. A fuse for a spinning type projectile having percussion means, comprising:

a housing,

a firing pin disposed in said housing for movement in the direction of its longitudinal axis, said firing pin comprising an ignition end projecting toward said percussion means,

a conical surface disposed coaxially with said axis and widening in a direction away from said ignition end, said conical surface being spaced axially from said ignition end, and

a cylindrical shoulder disposed adjacent the widened end of said conical surface and arranged concentrically relative to said axis,

a spring yieldably urging said firing pin toward said percussion means,

centrifugal means disposed in said housing and arranged to move radially relative to said firing pin,

a winding band surrounding said centrifugal means for urging said centrifugal means radially inwardly to a position wherein said centrifugal means lies in a blocking relationship with a portion of said firing pin at a location between and spaced from said conical surface and said ignition end to block axial travel of said firing pin, said band being radially outwardly yieldable in response to centrifugal forces generated by the spinning of said projectile to enable said centrifugal means to be radially outwardly displaced by centrifugal forces out of blocking relationship with said firing pin,

an inertia body mounted in said housing for movement in a radial direction relative to said firing pin, said inertia body being located at a position which is situated adjacent said conical surface when said centrifugal means is disposed in said blocking relationship with said firing pin, said inertia body including a throughbore through which said firing pin extends,

said throughbore being sized to permit said firing pin to travel therethrough to reach said percussion means, said inertia body being displaceable radially in response to centrifugal forces generated during spinning of the projectile such that one end edge of said throughbore, which end edge is of blunt configuration, lies in the path of said conical surface to block axial travel of said firing pin to said percussion means against the force of said spring, the force of said spring being great enough to displace said inertia body radially out of its blocking relationship with said firing pin when the centrifugal forces are reduced to a predetermined strength.

4,535,696

DEVICE FOR UNDERWATER MISSILES FOR USE AGAINST SUBMERGED SUBMARINES

Sven Landström, Fjäelgatan 16, Stockholm, Sweden S-116 45

Filed Aug. 30, 1983, Ser. No. 527,866

Claims priority, application United Kingdom, Aug. 31, 1982, 8224837

Int. Cl.³ F42B *15/10*

U.S. Cl. 102—380 **17 Claims**

1. In a device for underwater missiles for use against submerged submarines, said missiles including a housing having a front portion, intended to contact the outside surface of a submarine, the improvement comprising a tubular ring member rotatably attached to the front portion of the housing, said ring member being arranged to take up a rotary movement in relation to the housing when making contact with the outside surface of a submarine in motion.

4,535,697

CARTRIDGE CASE AND APPARATUS FOR PRODUCING THE SAME

Franz Moser, Fehraltorf, and Max Steinemann, Regensberg, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed May 2, 1983, Ser. No. 490,532

Claims priority, application Switzerland, Jun. 8, 1982, 3515/82

Int. Cl.³ F42B *5/28*

U.S. Cl. 102—468 **1 Claim**

1. An extruded steel cartridge case integrally formed from a one-piece blank, comprising:

a case base;

a case body having a wall thickness;

a conical shoulder having a wall having the same wall thickness throughout;

the wall thickness of said case body continuously decreasing from said case base to a predetermined intermediate location and continuously increasing from said predetermined intermediate location to a predetermined location in the direction towards said conical shoulder;

said predetermined intermediate location being closer to said conical shoulder than said case base;

said wall of said conical shoulder having a greater wall thickness than said wall thickness of said case body at said predetermined intermediate location thereof; and

a case neck following and adjacent to the conical shoulder having a wall which is thinner than said wall of said conical shoulder.

4,535,698

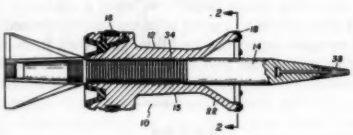
PYROTECHNIC NOSE CAP FOR PRACTICE MUNITIONS

Harvard Yuen, Parsippany, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 4, 1983, Ser. No. 548,902

Int. Cl.³ F42B *9/20*

U.S. Cl. 102—529 **1 Claim**



1. In an improved practice munition having a self-destruct, fin-stablized sub-projectile with an elongated body having a convergent end poriton made of a plurality of contiguous mating segments,

a discarding sabot mounted on said sub-projectile,

a nose cap encompassingly mounted on said convergent end poriton holding said contiguous mating segments together during launch and initial flight prior to release thereof,

the improvement consisting of:

a pyrotechnic nose cap containing 60 parts of magnesium, 30 parts of polytetrafluoroethylene, 20 parts of potassium nitrate and 10 parts of an epoxy binder, all parts being by weight based on the total weight of said nose cap, and

said nose cap fully disintegrating after initial flight of less than 5 miles for the destruction of said sub-projectile by the separating of said contiguous mating segments.

4,535,699

DEVICE FOR CONTROLLING A RAILROAD TRACK MAKING OR REPAIRING MACHINE

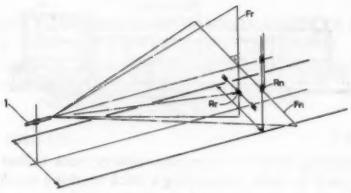
Fritz Bühler, Ecublens, Switzerland, assignor to Les Fils D'Auguste Scheuchzer S.A., Switzerland

Filed Sep. 3, 1982, Ser. No. 414,805

Claims priority, application European Pat. Off., Mar. 31, 1982, 82200403.2

Int. Cl.³ E01B *35/08, 35/10*

U.S. Cl. 104—7 B **13 Claims**



1. A device for controlling a railroad track making and repairing machine having working members for levelling, tamping and shifting a track in accordance with a first and second relative reference base, comprising:

a laser emitter system mounted ahead of said machine and having a laser adapted to emit a planar beam, along a predetermined axis parallel to said track, and means for rotating said beam around said axis between a first position in which said planar beam is horizontal and a second position in which the said planar beam is vertical; and

a laser beam receiving system mounted on said machine and consisting of a first receiver arranged and constructed to intercept said beam when said beam is horizontal, said first receiver being adapted to shift vertically until said planar beam impacts said first receiver at a first preselected point, said first receiver being operatively connected to orient said first relative base, and second receiver means arranged and constructed to intercept said planar beam when said beam is vertical, said second receiver being adapted to shift horizontally until said planar beam impacts said second receiver at a second preselected point, said second receiver being operatively connected to orient the second relative base.

11. A method for levelling, shifting and tamping a railroad track comprising:

providing a machine adapted to level, shift and to tamp the railroad track in accordance with a first relative reference base and a second relative reference base perpendicular to said first reference base;

providing a laser assembly adapted to generate a planar beam along a predetermined axis, said laser assembly further being adapted to emit said planar beam selectively along a horizontal or vertical plane by rotating said beam between a first and second positions;

providing a first receiver mounted on said machine and adapted to orient said first relative reference base when a planar beam is intercepted at a first point, said first receiver being adapted to move vertically with respect to said machine, and and a second receiver mounted on said machine and adapted to orient said first relative reference base when a planar beam is intercepted at a second point, said second receiver being adapted to move horizontally with respect to said machine;

positioning said laser assembly ahead of said machine with said preselected axis in parallel with said track;

directing said planar beam along one of said horizontal and vertical planes at the corresponding receiver; and

rotating said planar beam to direct along the other of said horizontal and vertical planes.

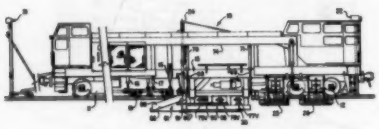
4,535,700
DEVICE FOR TAMPING RAILROAD TRACK ADJACENT THE TIE ENDS THEREOF

Helmuth von Beckmann, Columbia, S.C., assignor to Canron Inc., Toronto, Canada

Continuation-in-part of Ser. No. 235,032, Feb. 17, 1981, abandoned. This application Jan. 27, 1982, Ser. No. 343,331

Int. Cl.[3] **E01B** *27/17*

U.S. Cl. 104—12 **46 Claims**



1. A tamping device for tamping railway track ballast adjacent the track tie ends, comprising a track working machine; a tamper frame mounted on said machine; said frame, in operative position, extending substantially parallel to the rails of the track adjacent the tie ends thereof; a plurality of longitudinally extending tamping plate members mounted one behind the other on the frame and extending inwardly thereof towards the track center in stepped formation; each tamping plate member having a leading edge and a trailing edge, one of said edges being flexibly connected to said frame and the other of the edges being connected to positive displacement plate vibrator means mounted on said frame to drivingly vibrate the tamping plate relative to said frame.

4,535,701
DEVICE FOR SLOWING DOWN AND STOPPING MACHINES ROLLING ON RAILS

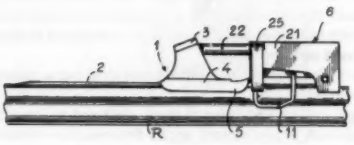
Guy Prioretti, 8 Rue Saint-Louis, 54400 Longwy, France

Filed Feb. 17, 1983, Ser. No. 467,225

Claims priority, application France, Feb. 17, 1982, 82 02582

Int. Cl.[3] **B61K** *7/06, 7/20*

U.S. Cl. 104—258 **20 Claims**



1. A slowing down and stopping device for a machine rolling on rails which have a head and a narrower web below said head, said device comprising a longitudinal axis and a longitudinally extending body for placing on top of said head of the rail for the purpose of receiving on top of the body a wheel of said machine and forming an abutment for said wheel, and means for connecting the device to the rail, the connecting means comprising a plate, resiliently yieldable claws which are mounted on the plate and are movable relative to said plate transversely of said axis between a spread-apart first position of rest for receiving said head therebetween and a second position in which said claws can close around and engage under said head, the plate being adapted to be applied against the top of the rail, and moving means pivotally connected to the plate and pivotable relative to said plate about an axis extending transversely of said longitudinal axis between an inoperative position in which inoperative position said moving means allow said claws to assume said first position and operative positions in which operative positions said movable means are cooperative with said claws for moving said claws toward each other and maintaining said claws in said second position thereof, said moving means comprising an element which is pivotally mounted on said plate and is rigid with said body so that said body is also pivotable about said transverse axis.

4,535,702
ARTICULATED RAILWAY VEHICLE

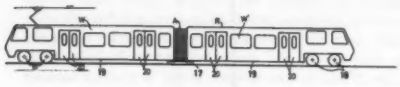
Fritz Hess, La Tour-de-Peilz, and Fernand Dalliard, Villeneuve, both of Switzerland, assignors to Ateliers de Constructions Mecaniques de Vevey S.A., Vevey, Switzerland

Filed Nov. 20, 1981, Ser. No. 323,477

Claims priority, application Switzerland, Jul. 30, 1981, 4934/81

Int. Cl.[3] **B61D** *17/10, 19/00, 23/02*

U.S. Cl. 105—4 R **1 Claim**



1. A railway vehicle, particularly adapted for urban use with access to and exit from and to a street, comprising, a frame including at least two sections adjacent each other, articulation means on a vertical axis connecting said sections to each other, each said section provided with a floor extending the length of said respective sections, stringers supporting each floor along its longitudinal edges, walls fitted with doors and windows, a roof connected to said walls, a single folding step provided at a level mid-way between the street and said floor of the vehicle adjacent said doors, said vehicle supported by at least two trucks, one said truck comprising a motorized truck, the other said truck comprising a supporting truck, said supporting truck including longitudinal beams each provided with a wheel at its opposite ends, said supporting truck wheels having a substantially smaller diameter than the diameter of the wheels of said motorized truck, a cross-beam extending between said longitudinal beams, bearing means joining one end of said cross-beam to one said longitudinal beam to permit articulation between said other longitudinal beam, said supporting truck located close to the end of one said frame section adjacent said articulation means connecting said two frame sections, the level of said floor of the vehicle at a right angle to the area corresponding to said supporting truck substantially lowered to provide ready access to and exit from said vehicle when said step is folded to a lowered position of use, said lowered floor having a flat surface extending longitudinally at least a majority of the length of said vehicle to a point adjacent said motorized truck, and said stringers supporting said floor extending from one end to the other end of that part of the vehicle where the floor is lowered and are located at the same level as said lowered floor.

4,535,703
WIRE OR LINE MANAGER

Jay M. Henriott, and David L. Hostetter, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Jun. 30, 1983, Ser. No. 509,958

Int. Cl.[3] **A47C** *35/00;* **H02G** *3/04*

U.S. Cl. 108—50 **16 Claims**

1. In a work station including a work platform having a top surface and an edge,

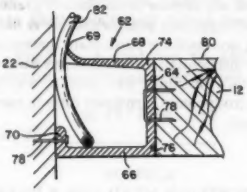
a wall member disposed adjacent to and spaced apart from said edge, and

a line-supporting trough disposed in the space between said edge and said wall member and comprising:

a support member secured to said edge,

said line-supporting trough including a rigid lower flange member connected to said support member and extending between said edge portion and said wall member and a flexible upper flange member secured to said support member and extending towards said wall member and

having an edge portion thereof spaced apart from said wall member, said upper flange forming a continuous coplanar surface with said work surface whereby electri-



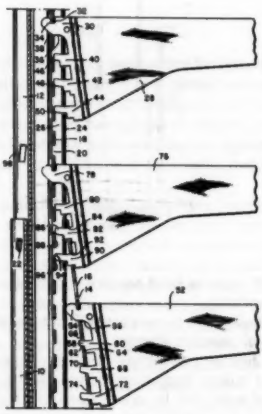
cal lines from electrical appliances and the like can be run in said trough from any point between said wall member and said flexible upper flange member and along said rigid lower flange member to selected areas.

4,535,704

SYSTEM OF SHELVING

James M. Suttles, Elberton, Ga., assignor to The Mead Corporation, Atlanta, Ga.

Filed Sep. 6, 1983, Ser. No. 529,397
Int. Cl.³ A47B *96/12*
U.S. Cl. 108—108 **8 Claims**



1. A system of shelving wherein identical shelves may be mounted interchangeably on the upper and lower parts of two-part, telescoping slotted supporting members in which the slotted surface of one of the telescoping members is recessed relative to the slotted surface of the other member, said system comprising:

a first support having a surface with a vertically extending series of slots and having an upper end;

a second support having a surface with a vertically extending series of slots and extending upwardly from the upper end of the first support; and

a shelf having a supporting surface and at least one shelf bracket, the shelf bracket having upper and lower tabs;

the series of slots in the slotted surface of the first support extending to a location adjacent to the upper end of said first support whereby said shelf can be mounted with its upper tab in engagement with a slot in the second support and its lower tab extending into a slot in the lower support;

the slotted surface of the second support being recessed behind the slotted surface of the first support by a distance such that, when the shelf is mounted at any position on the first support with its tabs extending through slots in said first support, the recess provides clearance for said tabs;

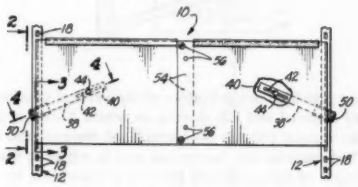
and having means for causing the supporting surface to be situated in the same relationship to the horizontal when the shelf is mounted with both tabs engaged with the second support, and when the shelf is mounted with its upper tab engaged with a slot in the second support and its lower tab extending into a slot in the first support.

4,535,705

SYSTEMS IN WHICH ONE OR MORE OBJECTS ARE SUPPORTED BY VERTICAL STANDARDS

George Soulakis, Hermosa Beach, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.

Filed Aug. 11, 1983, Ser. No. 522,405
Int. Cl.³ A47B *5/00*
U.S. Cl. 108—152 **7 Claims**



1. A system in which an object is held by two spaced, parallel, vertically extending standards having perforate surfaces facing the same direction and hollow interiors adjacent to said perforate surfaces through the use of hooks on said object extending through perforations in both of said surfaces and engaging the interiors of said standards, in which the improvement comprises:

a sloped surface on said object adjacent to one of said standards,

a wedging member associated with said sloped surface, and mounted on said object so as to be capable of being moved relative to said object,

said wedging member being capable of being moved relative to its associated sloped surface so as to be wedged between its associated sloped surface and the adjacent standard so as to move said object outward from said standard in order to pull said hook firmly in contact with the interior of said standard.

4,535,706

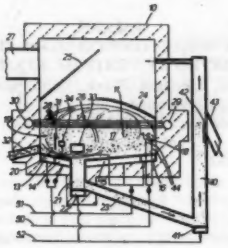
FLUIDISED BEDS

John T. Klaschka, Fleet, England, assignor to Sodic Societe Anonyme, Fribourg, Switzerland

PCT No. PCT/GB81/00172, § 371 Date Apr. 20, 1982, § 102(e) Date Apr. 20, 1982, PCT Pub. No. WO82/00871, PCT Pub. Date Mar. 18, 1982
Continuation of Ser. No. 375,119, Apr. 20, 1982, abandoned.
This PCT application Aug. 28, 1981, Ser. No. 592,725
Claims priority, application United Kingdom, Aug. 29, 1980, 8028032
Int. Cl.³ F22B *1/02;* **F23G** *5/00*
U.S. Cl. 110—245 **16 Claims**

1. A fluidised bed combustor comprising a housing and an air diffuser bed support arrangement disposed in the housing to support and fluidise a bed of material in the housing, there being formed in the bed a combustion zone in which material to be burned is burned, a feed zone into which material or fuel to be burned may be fed and mixed with the material of the bed, an ash segregation zone in which ash resulting from combustion may be at least partially separated from the bed material, and in which a diffuser is arranged to cause the bed mate-

rial to circulate in operation around a path extending from the combustion zone, through the feed zone, through the ash segregation zone, and back into the combustion zone, in which an ash collecting trough is provided below said diffuser to lie adjacent said path between said ash segregation zone and said combustion zone, in which a conduit leads from the bottom of said ash trough to the bottom of a generally vertical conduit extending outside the housing to above the surface of the bed,



means being provided in the bottom of the vertical conduit to fluidise bed material and ash therein, in which a weir is provided in the vertical column over which ash material and any entrained bed material may be ejected, and in which in operation the height of the surface of the bed is controlled by the height of said weir and the material in the vertical conduit is fluidised to a sufficient extent to achieve flow of excess material over the weir.

4,535,707

HIGH TURNDOWN RATIO FLUIDIZED BED REACTOR AND METHOD OF OPERATING THE REACTOR

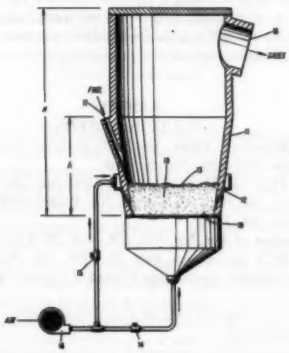
Jakob Korenberg, York, Pa., assignor to York-Shipley, Inc., York, Pa.

Continuation of Ser. No. 233,507, Feb. 11, 1981, Pat. No. 4,341,515. This application Apr. 22, 1982, Ser. No. 370,918

The portion of the term of this patent subsequent to Jul. 27, 1999, has been disclaimed.

Int. Cl.³ F22B *1/02*

U.S. Cl. 110—245 **9 Claims**



1. A method of operating an adiabatic fluidized bed reactor that utilizes a bed of granular material for combusting non-uniform particulate matter to obtain a hydrodynamic turndown ratio in excess of 2 to 1 comprising:

providing an adiabatic fluidized bed reactor having reactor walls terminating in a support surface that supports a bed of granular material;

feeding non-uniform particulate matter to said reactor;

supplying pressurized air to said reactor in excess of the stoichiometric amount needed for combustion both through openings located in said support surface and through openings located in said reactor walls having outlets below the surface of said bed of granular material, wherein said supplying pressurized air is independent of said feeding non-uniform particulate matter, and

adjusting the distribution of pressurized air between said support surface openings and reactor wall openings to permit a hydrodynamic turndown ratio in excess of 2 to 1 to be obtained.

4,535,708

HOT BULB IGNITION HEAD FOR A DEVICE FOR FIRING ROUGH CERAMICS, PARTICULARLY BRICKS

Andreas Friedl, Marienberger Str. 27, D-8263 Burghausen, Fed. Rep. of Germany

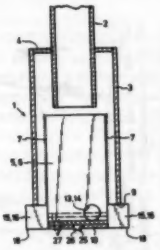
PCT No. PCT/DE82/00132, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO83/00209, PCT Pub. Date Jan. 20, 1983

Continuation of Ser. No. 433,127, Sep. 30, 1982, abandoned. This PCT application Jun. 22, 1982, Ser. No. 606,848

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1981, 8118921[U]

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—265 **10 Claims**



1. A hot bulb ignition head adapted for receiving therein a solid fuel, comprising:

an elongate hollow body member of finite length and defining a central chamber therein;

an elongate hollow connecting conduit connected to one end of said hollow body member and for the intermittent delivery of solid fuel by compressed air, the interior of said connecting conduit being in open communication with said central chamber, said hollow body member having a larger diameter than said connecting conduit;

a pair of side plates oppositely disposed in said hollow body member and secured to the interior wall of said hollow body member along lateral edges thereof extending coextensively with the longitudinal axis of said hollow body member, said side plates extending beyond the other end of said hollow body member remote from said connecting conduit, the terminal ends of said side plates terminating externally of said hollow body member, each said side plate between said lateral edges thereof being spaced from said interior wall of said hollow body member to define a back-pressure chamber which opens outwardly of said hollow body member at said other end; and

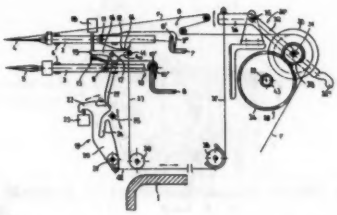
a baffle plate secured to and extending between the terminal ends of said side plates located externally of said hollow body member, the mutually adjacent edges of said baffle plate, said side plates and said hollow body member defining oppositely and radially facing first openings between said central chamber and the exterior of said hollow body member.

4,535,709

SWITCHABLE BRAKING MECHANISM, ESPECIALLY FOR THE INDIVIDUAL THREADS OF AN EMBROIDERY MACHINE

Ernst Kühnis; Armin Kobler, both of Oberriet; Max Schreiber, Arbon, and Hans Wallimann, Goldach, all of Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Jun. 4, 1984, Ser. No. 616,716
Claims priority, application Switzerland, Jun. 16, 1983, 3307/83
Int. Cl.[3] D05C *3/04*
U.S. Cl. 112—83 17 Claims



1. A switchable braking mechanism for braking an individual thread supplied to the needle at a related embroidery location in an embroidery machine including a linear arrangement of such embroidery locations at each of which a related needle is mounted and operated according to a programmed control of the embroidery machine, said switchable braking mechanism comprising:

a predetermined number of switching levers;

each one of said switching levers being operatively associated with a related needle and automatically and individually adjusting the related needle into a working position or into a rest position in accordance with the programmed control of the embroidery machine;

a predetermined number of thread guiding rollers;

each one of said thread guiding rollers being operatively associated with said related needle and supplying the individual thread to said related needle;

a predetermined number of roller supporting levers;

each one of said thread guiding rollers being journaled at the related roller supporting lever for free rotation;

a common braking member;

each one of said roller supporting levers being pivotable between an operative position and an inoperative position in which each said thread guiding roller is respectively coupled to or decoupled from said common braking member;

a predetermined number of driving connection arrangements;

each said driving connection arrangement being provided between a related one of said thread guiding rollers and said common braking member and acting in the manner of a reducing gear when said related thread guiding roller is coupled to said common braking member;

a predetermined number of connecting members; and

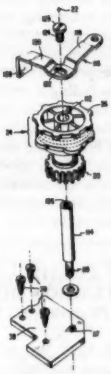
each one of said roller supporting levers being pivotable via a related one of said connecting members leading to a related one of said switching levers acting on the related needle in order to activate or deactivate the related embroidery location.

4,535,710

STABILIZING ARRANGEMENT FOR A SEWING MACHINE CAM POST

Jan Szostak, Lincroft, and Frank Fennesz, Jr., Manhawkin, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 7, 1984, Ser. No. 679,341
Int. Cl.[3] D05B *3/00*
U.S. Cl. 112—459 8 Claims



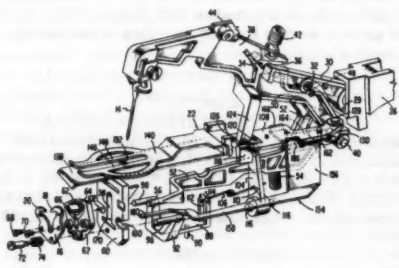
1. In a sewing machine, a vertical post which is affixed at one end in the machine; a rotatable cam for controlling a sewing function, the cam being supported on the post; a cam follower which is spring biased for enforced engagement with the cam, and which while so biased against the cam, subjects the post to a bending moment; a bracket for resisting distortion of the post, the bracket being angularly configured and being pivotally mounted at one end portion in the machine to permit adjustment of the bracket into a position wherein another end portion is supported against fixed machine structure, said bracket including an elongate slot; and a fastener extending through the slot into the upper end of the post for affixing the bracket to the post while said another end portion is against the fixed machine structure.

4,535,711

LOOPER-CAM SHIFTING ARRANGEMENT FOR A SEWING MACHINE

Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 12, 1984, Ser. No. 660,167
Int. Cl.[3] D05B *57/02, 97/02, 97/10*
U.S. Cl. 112—199 5 Claims



1. In a sewing machine; a frame; a driving member; a needle;

means operably connected to the driving member for reciprocating the needle; a looper and cam assembly mounted for pivotal movement on the frame in a plane extending transversely therein, the looper being formed with a pair of loop seizing points and the cam including a pair of intersecting cam tracks; a longitudinally extending actuator in the frame operably connected to the driving member and engageable with the cam on said cam tracks for imparting pivotal movement to said assembly and disposing the looper points for cooperation with the needle in the formation of chain stitches; a longitudinally extending bed; means for moving work laterally on the bed including a longitudinally extending member which is operably connected to said driving member for actuation thereby and is mounted in the frame for pivotal reciprocable movement about an axis extending perpendicular with respect to the plane of the bed; and an arm including a resiliently flexible portion, the arm being operably connected at one end to the longitudinally extending pivotable reciprocable member for flexure thereby, and at the other end to the looper-cam assembly for biasing the looper-cam assembly in opposite directions according to the position of the longitudinally extending pivotably reciprocable member to thereby control movement of the said actuator between the cam tracks.

4,535,712

VARIABLE AIR CUSHION MODE VEHICLE

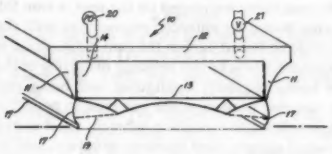
Leslie N. Matthews, 110 Fitzgerald St., Geraldton, W.A., Australia 6530

Filed Dec. 14, 1982, Ser. No. 453,888

Claims priority, application Australia, Apr. 16, 1981, PE8497

Int. Cl.³ B63B *1/38*

U.S. Cl. 114—61 **11 Claims**



1. A boat hull comprising at least one longitudinally extending hull having lateral extremities, an intermediate hull portion between the lateral extremities of said at least one hull, air entrainment means extending between the lateral extremities of the hull adjacent the rear end of the intermediate hull portion, means to raise and lower the intermediate hull portion relative to the remainder of the hull between a lowered position wherein the intermediate hull portion is in contact with the water in which the boat hull floats and a raised position wherein a chamber is defined, when air is introduced under pressure beneath said intermediate hull portion, between said intermediate hull portion, the water, said lateral extremities of the hull and said air entrainment means, and means to introduce air beneath the intermediate hull portion when it is in the raised position so that the hull may then be supported on a cushion of air.

4,535,713

LAYOUT OF A SHIP STEERING-HOUSE

Johannes van Roon, A 74, 2975 BC Ottoland, Netherlands

Continuation of Ser. No. 407,814, Aug. 13, 1982, abandoned, which is a continuation of Ser. No. 170,973, Jul. 18, 1980, abandoned. This application Mar. 20, 1984, Ser. No. 590,531

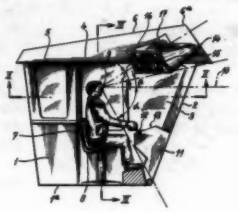
Claims priority, application Netherlands, Jul. 20, 1979, 7905665

Int. Cl.³ B63B *29/00*

U.S. Cl. 114—71 **13 Claims**

1. A steering house for a ship or other floating vessel, said steering house having a front window slanting outwardly at its upper end and arranged to provide a free angle of vision between about 15° upward and at least about 30° downward from a horizontal plane through the center of vision for a seated commander, said steering house being provided with means for navigation and control of different functions in the ship, and comprising:

(a) an integrated reading unit, including a radar apparatus and other essential instrument means for supplying visual information for navigation and control of the ship, fitted near the roof-ceiling of said steering house and in front of the seated commander, and located in an upper position with an angle of vision for the seated commander between about 15° and 30° upward, wherein said instrument means are placed at either side of the radar apparatus screen, such that the instrument reading surfaces are oriented



substantially perpendicular to the direction of view and from the center of vision of the seated commander and have a mainly spherical-sector shaped reading surface, said reading unit being vertically movable by the commander from said upper position to a position below said horizontal plane by suitable guiding means, which maintain said integrated reading unit surface during its vertical movement continuously substantially perpendicular to the direction of view of the commander, all positions of said reading unit being working positions; and

(b) control means located in floor-mounted consoles at both sides of the seated commander, said control means being located within hand reach of the commander, so as to provide the commander with a free field of vision roundabout and especially in forward directions of the ship.

4,535,714

RUDDER ROTOR FOR WATERCRAFT AND FLOATING EQUIPMENT

Fred Petersen, Hamburg, Fed. Rep. of Germany, assignor to Firma Jastram-Werke GmbH KG, Hamburg, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 90,042

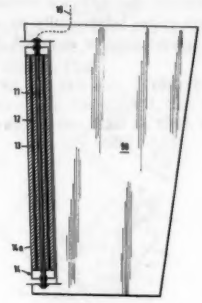
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851733

Int. Cl.³ B63H *25/40*

U.S. Cl. 114—162 **13 Claims**

1. In a rudder assembly for watercraft and floating equipment including a rudder plate and a rudder rotor mounted on said rudder plate, said rudder rotor including rotating external surface means, the improvement comprising that said rudder rotor is itself constructed as an electric motor to include components forming said rudder rotor as an underwater electric motor consisting essentially of a motor stator and a motor rotor operative to rotatively drive said rotating external surface means, said motor stator and said motor rotor being physically completely contained within the structure of said rudder rotor, said assembly further comprising power supply means extend-

ing externally of said rudder rotor for supplying power to drive said electric motor, and wherein the inner area of said



rudder rotor is sealed in an air-tight manner at the top and has no seal towards the bottom.

4,535,715

AIR VENT

Ian A. McIntosh, 3 Muston St., Mosman, N. SW., Australia (2088)

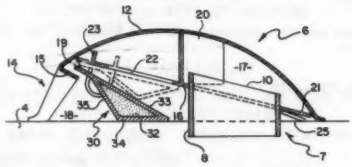
PCT No. PCT/AU83/00046, § 371 Date Jan. 10, 1984, § 102(e) Date Jan. 10, 1984, PCT Pub. No. WO83/04010, PCT Pub. Date Nov. 24, 1983

PCT Filed Apr. 19, 1983, Ser. No. 569,625

Claims priority, application Australia, May 11, 1982, PF3949

Int. Cl.³ B63J *2/00*

U.S. Cl. 114—211 **9 Claims**



1. A deck ventilator comprising a squat cap having a side wall formed with a window next to the deck; a common-wall formed with an orifice and dividing the cap interior into two chambers one of which communicates with the window; a ventilator duct in the other chamber and having its lower end portion projecting downwardly through the deck; hinge means in said one chamber; a closure member turnable about the hinge means from a first position at which the orifice is unobstructed and to which the member is biased, to a second position at which the member closes the orifice and a buoyant element effectively integral with the member and which biases it to the second position when the closure member is impacted upon by a horizontally directed surge of water running along the deck and entering said one chamber by way of the sideways facing window.

4,535,716

MINESWEEPING

John W. Hill, Church Point, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

Filed Dec. 21, 1982, Ser. No. 451,907

Claims priority, application Australia, Dec. 24, 1981, PF2077

Int. Cl.³ B63G *9/00*

U.S. Cl. 114—221 R **19 Claims**

1. A sweep comprising an elongated rigid buoyant body dimensioned and constructed for deployment in water as a magnetic mine sweep and being resistant to explosive forces released by a magnetic mine when activated by the sweep, the rigid body including:

at least one block of permanent magnet material having pole faces; and

distributor elements of a material of high magnetic permeability and high saturation level, the distributor elements being mounted with faces thereof in intimate proximity to the pole faces for conducting the flux with little loss of

magnetomotive force, the distributor elements associated with the or each said block extending away from the pole faces thereof in opposite directions and along the direction of elongation of said rigid body for distributing the magnetic flux so as to establish a magnetic field extending through the water for magnetic mine sweeping purposes and whereby the sweep has long service life between remagnetizations and a high ratio of magnetic moment to mass.

4,535,717

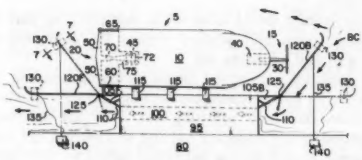
MARINE SURFACE DEBRIS DEFLECTOR

Darold R. Bryan, Seattle, and George Z. Porter, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 318,718, Nov. 6, 1981, abandoned. This application Dec. 14, 1983, Ser. No. 562,027

Int. Cl.³ B63B *35/38*

U.S. Cl. 114—230 **6 Claims**



1. An apparatus for diverting debris, borne by a variable direction current water stream, from the proximity of a water-ingesting watercraft employing a waterjet propulsion system, said watercraft being moored adjacent to a dock, located in said water stream, where debris tends to accumulate, said apparatus comprising:

a floatable structure disposable adjacent to said watercraft in said water stream, said structure comprising a first and a second pontoon which are separated to define an internal open-ended channel for conducting debris borne by said variable direction current along a path away from said watercraft, said first pontoon being disposed contiguous to said watercraft and having a surface capable of being presented to said watercraft, said channel having an inlet and an outlet for conducting currentborne debris, and

means for guiding debris into said channel, said debris guiding means comprising a deflecting member disposable in said water stream and affixed, at said inlet and at said outlet, to said first pontoon, each of said deflecting members having a first surface extending parallel to and coextensive with said first pontoon surface, each of said deflecting members also having an inclined surface intersecting said first surface and extending toward said channel, whereby debris may be guided away from said watercraft and into said channel.

4,535,718
INDICATOR FOR SAFETY SKI BINDING

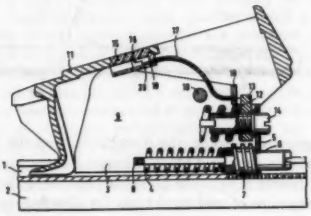
Gerd Klubitschko, Oberau, Fed. Rep. of Germany, assignor to Marker International Company, Salt Lake City, Utah

Filed Feb. 9, 1983, Ser. No. 465,111

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204649

Int. Cl.³ G01L *5/03*

U.S. Cl. 116—212 **2 Claims**



1. An indicator in a safety ski binding, said binding including at least one grasping piece having latching and releasing positions for latching and releasing a portion of a ski boot, respectively, said grasping piece comprising:

a stationary part fixable to a ski;

a pivoting part pivotally connected to said stationary part along a transverse axle for engaging a ski boot;

a spring for establishing a force release threshold for said pivoting part;

mounting means fixed in said stationary part and an adjusting nut mounted for movement on said mounting means relative to said stationary part for changing the compression of said spring to vary said force release threshold;

window means in said pivoting part for viewing an indicating means;

sliding indicating means disposed in said pivoting part and visible through said window means for indicating the setting of said adjusting nut;

flexible indicator connecting means including first and second ends for movably interconnecting said sliding indicating means and said adjusting nut, said first end being connected to said adjusting nut and said second end being connected to said sliding indicating means for movement of said sliding indicating means by said adjusting nut when said adjusting nut moves on said mounting means and said connecting means comprising a flexible cable and a flexible sheath through which said cable passes.

4,535,719
LIQUID DISPENSING GUN WITH SUBSTRATE SEPARATOR

Donald J. Regan, deceased, late of Kennesaw, Ga. (by Joyce H. Regan, heir), assignor to Nordson Corporation, Amherst, Ohio

Filed Apr. 6, 1984, Ser. No. 597,445

Int. Cl.³ B05C *3/02*

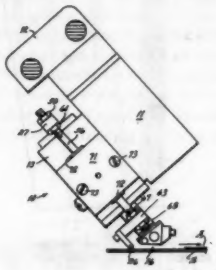
U.S. Cl. 118—410 **8 Claims**

1. A dispensing gun, for applying a liquid to a substrate, including a gun body and a nozzle, the gun having a liquid storage chamber, a passage communicating between the liquid storage chamber and a source of the liquid to be applied, and a nozzle outlet communicating with the liquid storage chamber from which the liquid is dispensed onto the substrate, and further comprising:

valve means for controlling liquid flow from the liquid storage chamber to the nozzle outlet including a movable valve stem having a valve-opened position in which liquid flows through the nozzle outlet from the liquid storage chamber and a valve-closed position in which the flow of liquid from the liquid storage chamber is prevented;

means for moving the valve stem between said valve-opened and valve-closed positions;

a deflector element movably mounted on the gun substantially adjacent the substrate, the deflector element having a first position in which it has substantially no influence on the substrate and a second position in which the deflector element deflects the substrate out of contact with the nozzle; and



means for moving the deflector element to its first position when the valve stem is moved to its valve-opened position and for moving the deflector element to its second position when the valve stem is moved to its valve-closed position.

4,535,720
LIQUID PHASE EPITAXY APPARATUS

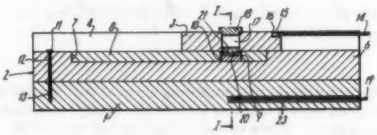
John C. Brice, Copthorne Bank; John L. Page, Haywards Heath, and Peter A. C. Whiffin, Horsham, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1984, Ser. No. 592,770

Claims priority, application United Kingdom, Apr. 27, 1983, 8311429

Int. Cl.³ H01L *21/208*

U.S. Cl. 118—415 **9 Claims**



1. A sliding boat liquid phase epitaxy apparatus comprising

a supporting base structure;

a substrate supporting structure disposed on said base structure, said supporting structure being horizontally fixed with respect to said base structure;

wherein said supporting structure includes a block member on said base structure; a flat-bottom recess in a portion of the top surface of said block member, said recess being located between ends of said block member; and a plate member fitted into said recess so that said plate member has a top surface level with the top surface of said block member outside of said plate member, said plate member having an aperture for containing a substrate for epitaxial growth; and

a slidable well member disposed above said substrate supporting structure in abutting relationship, said well member having at least one well containing growth solution, and said well member being slidable in the length direction of said base structure;

wherein said aperture of said plate member can be disposed beneath said well, and

wherein said plate member is a material different from material of said well member.

4,535,721

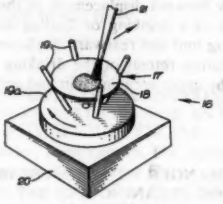
APPARATUS FOR ROTATING A WAFER

John Yakura, Visalia, Calif., assignor to California Linear Circuits, Inc., La Mirada, Calif.

Division of Ser. No. 556,893, Dec. 1, 1983, Pat. No. 4,490,111, which is a division of Ser. No. 421,811, Sep. 23, 1982, Pat. No. 4,510,672. This application Mar. 16, 1984, Ser. No. 590,167

Int. Cl.³ B05C *13/02*

U.S. Cl. 118—503 **1 Claim**



1. An apparatus for supporting and rotating a semi-conductor wafer while a dopant is applied thereto, comprising:

a base member mounted for rotation about a vertical axis, and

a plurality of non-pivotally mounted resilient fingers projecting upwardly from said base member in divergent relationship with each other, each of said fingers being notched on a side facing said base member vertical rotation axis to peripherally support said wafer in said notches in a generally horizontal plane, and

means for slowly rotating said base member and fingers while said wafer is generally horizontally supported in said notches of said fingers.

4,535,722

APPARATUS FOR APPLYING MOLTEN WAX ONTO PRINTED CIRCUIT BOARD

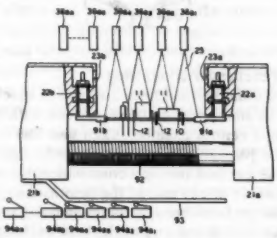
Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 556,187

Claims priority, application Japan, Dec. 1, 1982, 57-209287

Int. Cl.³ B05B *12/00*

U.S. Cl. 118—692 **7 Claims**



1. An apparatus for applying molten wax onto a printed circuit board travelling along a predetermined transfer path, comprising a vessel for containing a molten wax, a plurality of ejection nozzles arranged in a direction transverse to the transfer path, individual valve means connected to each of the ejection nozzles and operable so that the molten wax is ejected from each nozzle onto the printed circuit board travelling adjacent thereto upon actuation of the corresponding valve means, a pump having an intake in fluid communication with the vessel and a discharge in fluid communication with each of the valve means, means for selectively rendering the valve means operable according to the width of the printed circuit board, and an adjustable flow control means in fluid communication with said ejection nozzles and having an inlet in fluid communication with the discharge of the pump and an outlet in fluid communication with the intake of the pump, said flow control means adjustable for controlling the rate of the flow of the molten wax through the ejection nozzles by diverting a controlled amount of the molten wax through the inlet and out of the outlet.

4,535,723

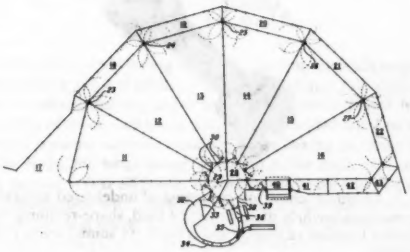
ANIMAL HANDLING AND PROCESSING FACILITY

Elizabeth L. Gealy, P.O. Box 1103, La Jolla, Calif. 92038

Filed Jun. 9, 1980, Ser. No. 157,685

Int. Cl.³ A01K *1/00*

U.S. Cl. 119—20 **5 Claims**



1. An animal handling facility comprising:

a first plurality of gates defining at least a portion of the perimeter of a generally circular sorting area;

a second plurality of gates hinged on a single post centrally located in said sorting area, dividing said sorting area into separate sections; a plurality of enclosures adjoining said sorting area, such that each of said enclosures is separated from the sorting area by one of said perimeter gates; means for guiding an animal from said sorting area into one or more processing stations; and

means for guiding said animal from said station or stations back into a different section of said sorting area, such that re-sorting of processed animals may be achieved without interrupting the passage of incoming animals.

4,535,724

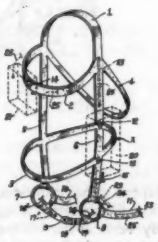
TRAINING AND CARE APPARATUS FOR HORSES

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Aug. 2, 1984, Ser. No. 637,113

Int. Cl.³ A01K *15/00*

U.S. Cl. 119—29 **13 Claims**



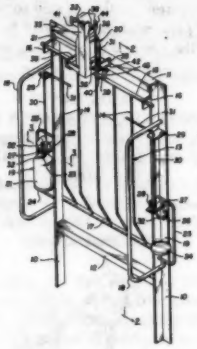
1. A horse training apparatus, comprising:

means for storing a quantity of a fluid;
means for mounting the fluid storing means on a body portion of a horse;
conduit means for delivering fluid to the horse's mouth;
pump means for drawing fluid from the storing means and propelling it through the conduit means; and
control means actuable by a handler for selectively operating the pump means.

4,535,725
HAIR-CONTAINING RAWHIDE TOYS
Stanton E. Fisher, 16 Brentmoor Park, St. Louis, Mo. 63105
Filed Jun. 3, 1977, Ser. No. 803,164
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—29 **8 Claims**

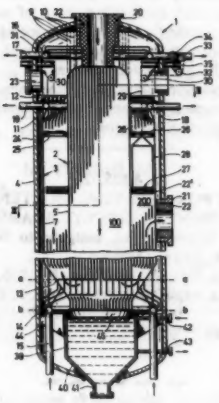
2. An animal chew toy consisting of undehaired natural hair containing rawhide dried to yield a hard, shape-retaining body, having inherent resiliency and is cut in an animal shape configuration.

4,535,726
ANIMAL SPRAYING APPARATUS
Grover L. Cauthron, Rte. 1, Box 29, Fairview, Mo. 64842
Continuation-in-part of Ser. No. 473,053, Mar. 7, 1983, Pat. No. 4,459,942. This application May 11, 1984, Ser. No. 609,325
The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—159 **5 Claims**



1. An animal spraying apparatus comprising an upright support frame adapted to be positioned adjacent to one side of an animal feed box or watering trough, a free-hanging normally substantially vertical barrier on the support frame and being connected therewith through an upper horizontal axis rocker shaft whereby the barrier is vertically swingable forwardly and rearwardly on the axis of said rocker shaft, an upper center animal spraying unit on the support frame above said barrier and adapted to apply spray to the back of a drinking or feeding animal, two laterally spaced opposing side spraying units on the support frame on opposite sides of the barrier and near the lower end of the barrier and at an elevation substantially below the elevation of the upper spraying unit, the two side spraying units being adapted to apply sprays simultaneously to the opposite sides of the face of a drinking or feeding animal subsequent to the application of spray by the upper spraying unit and while the drinking or feeding animal is retreating from the apparatus, said upper and two side spraying units having individual vertical axis rotary actuating elements including parts in the path of movement of parts on said barrier, whereby forward displacement of the barrier caused by the approach of a drinking or feeding animal activates the upper spraying unit and rearward displacement of the barrier by gravity during retreat of the drinking or feeding animal deactivates the upper spraying unit and activates the two side spraying units.

4,535,727
HEAT EXCHANGER WITH ADJUSTABLE PLATFORM FOR CLEANING AND REPAIRING
Georg Ziegler, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Jul. 6, 1984, Ser. No. 628,473
Claims priority, application Switzerland, Jul. 7, 1983, 3730/83
Int. Cl.³ F22B *1/02*; F27D *1/16*
U.S. Cl. 122—32 **11 Claims**



1. A heat exchanger comprising
a pair of coaxial vertical flues disposed in spaced relation to define an annular space therebetween with the inner flue defining a central chamber, each said flue including wall tubes for passage of a medium therethrough;
at least one gas lead-through communicating with said central chamber at one end of the heat exchanger;
at least one gas lead-through communicating with said annular space at said one end of the heat exchanger;
at least one orifice in said inner flue communicating said central chamber with said annular space at an opposite end of the heat exchanger;
an annular platform disposed within said space coaxial of said flues;
means for moving said platform vertically between said flues; and
at least one manhole between said gas leadthroughs for providing access to said space.
7. A heat exchanger comprising

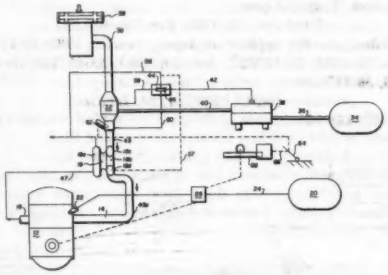
a pressure vessel;
a pair of concentric vertical flues disposed within said vessel in spaced relation to define an annular space therebetween with the inner flue defining a central chamber;
at least one spigot in said vessel communicating with said central chamber at one end of said vessel;
at least one spigot in said vessel communicating with said space at said end of said vessel;
an annular platform disposed within said space concentrically of said flues;
means for moving said platform vertically between said flues; and
at least one manhole in said vessel between said spigots for providing access to said space.

4,535,728

FUEL FEED CONTROL SYSTEM AND CONTROL VALVE FOR DUAL FUEL OPERATION OF AN INTERNAL COMBUSTION ENGINE

William H. Batchelor, Jensen Beach, Fla., assignor to Propane Carburetion Systems, Inc., Stuart, Fla.

Filed Feb. 2, 1984, Ser. No. 576,428
Int. Cl.³ F02M *21/02*
U.S. Cl. 123—27 GE **15 Claims**



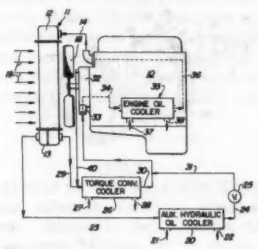
1. A supplemental gas fuel control system for a dual fuel supply system for an internal combustion engine having an air intake duct for conveying an intake airstream to the engine, an exhaust duct, and using a primary liquid fuel, the control system comprising a pressure regulator including a movable regulator valve positionable for controlling flow of supplemental gas fuel from a high pressure source to the intake airstream of the engine within said air intake duct, the position of the regulator valve normally governed by engine inlet airstream flow conditions, said flow conditions communicated normally to the pressure regulator by using an air intake duct suction pressure signal acting on a controller for the regulator valve; a condition comparator means; means for sensing exhaust gas rate of flow of the engine and communicating an exhaust flow signal corresponding to same to the condition comparator means; means for sensing a reference pressure in a reference pressure zone in the engine air intake duct and communicating a reference signal corresponding to same to the condition comparator means; means for sensing intake air rate of flow at an intake duct zone downstream of a source of said reference signal, and communicating an intake air flow signal corresponding to same to said condition comparator means; said condition comparator means including means for proportioning said exhaust flow, reference and intake air flow signals to produce a net control signal; means for communicating said net control signal to said supplemental fuel pressure regulator; said pressure regulator including means for modulating the position of said regulator valve in response to both said suction pressure signal and said net control signal.

4,535,729

VEHICLE COOLING SYSTEM UTILIZING ONE RADIATOR

Lawrence E. Faylor, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 5, 1984, Ser. No. 658,253
Int. Cl.³ F01P *3/12*
U.S. Cl. 123—41.1 **8 Claims**



1. An integrated cooling system for cooling a vehicle engine, transmission oil, and auxiliary hydraulic function oil, comprising: a radiator having upper and lower cavities joined by a plurality of tubes, said lower cavity being divided into first and second separate sections; a coolant pump having an intake and a discharge, the latter being connected to the engine for cooling thereof; a first oil cooler having an oil intake and outlet in communication with and for circulating the transmission oil in the cooler, said cooler having a connection to said first section for transferring coolant from the latter to said first oil cooler; a second oil cooler having an oil inlet and outlet in communication with and for circulating auxiliary hydraulic oil through the cooler, said latter cooler having a connection to the coolant in said second section for transferring coolant from said second section to said second cooler; first and second coolant discharge conduit means receiving the respective coolant from the first and second coolers and connected to the intake of the pump; a valve means in said conduit means for controlling the quantity and temperature of coolant moving through the respective coolers; and a return from the engine to said upper cavity.

4,535,730

ROCKER ENGINE

Dillis V. Allen, 1080 Nerge Rd., Suite 205, Elk Grove Village, Ill. 60007

Filed Dec. 8, 1980, Ser. No. 214,082
Int. Cl.³ F02B *75/04*
U.S. Cl. 123—78 F **12 Claims**

1. An internal combustion engine of the piston and cylinder type having valves for admitting fuel to the cylinder and exhausting the products of combustion, comprising; a cylinder, a piston reciprocable in the cylinder and having a stroke length with piston top dead center and piston bottom dead center positions, a crank driven by the piston rotationally mounted about an axis, an output shaft driven in rotation by the piston, means for varying the length of stroke of the piston as the

engine is operating, and means for varying the top dead center position of the piston as the engine is operating without varying the length of stroke of the piston and without moving the rotational axis of the crank.

4,535,731

DEVICE FOR AUTOMATICALLY VARYING THE TIMING OF A CAMSHAFT

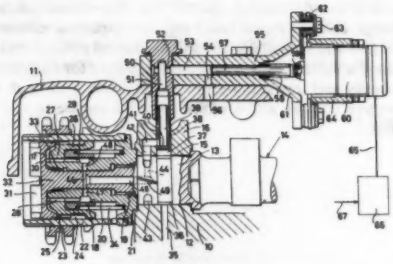
Ambrogio Banfi, Milan, Italy, assignor to Alfa Romeo Auto S.p.A., Naples, Italy

Filed May 5, 1983, Ser. No. 491,705

Claims priority, application Italy, May 17, 1982, 21313 A/82

Int. Cl.³ F01L *1/34*

U.S. Cl. 123—90.15 **4 Claims**



1. A device for automatically varying the timing of a camshaft relative to the drive shaft of an internal combustion engine, the camshaft being supported by bearings lubricated by pressurized oil of the engine lubrication circuit, the camshaft being driven in timed relation with the drive shaft by a toothed pulley rigidly affixed with a tubular member, the device comprising a sleeve movable axially within the tubular member in order to connect the toothed pulley to the camshaft, the sleeve being constrained to the tubular member by means of a straight toothed splined connection and being constrained to the camshaft by means of a helical toothed connection, an annular piston being rigidly affixed with the sleeve, a circular plate being rigidly affixed with the camshaft, the circular plate with the tubular member and the annular piston forming a chamber, the chamber being integrally connected to the engine lubrication circuit which feeds the pressurized oil to the camshaft support bearings by passage means for permitting oil to flow to the chamber, a presized orifice in said passage means for controlling the rate of oil flow to said chamber, vent means coupled to said passage means downstream of said presized orifice for communicating the passage means to atmosphere, said vent means including axially movable valve means for opening and closing said vent means and thereby regulating the feed and discharge flow of oil through the passage means, said vent means being normally open to allow the discharge of oil from said chamber, the axially movable valve means being operationally connected to an electromagnetic linear actuator which receives a command in the form of an electric signal from an electronic central unit in response to signal received from prechosen engine parameter sensors whereby the axially movable valve means moves to close the vent means causing oil to flow to the chamber.

4,535,732

VALVE DISABLING DEVICE FOR INTERNAL COMBUSTION ENGINES

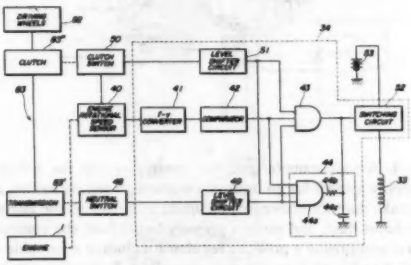
Yoshikatsu Nakano, Kawagoe, and Masaaki Matsuura, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,572

Claims priority, application Japan, Jun. 29, 1983, 58-117826; Jun. 29, 1983, 58-117827; Jun. 29, 1983, 58-117828; Jun. 29, 1983, 58-117829

Int. Cl.³ F01L *1/34, 1/26*

U.S. Cl. 123—90.16 **16 Claims**



1. A valve disabling device for use in an internal combustion engine having inlet valve means, exhaust valve means, at least one of which comprises a plurality of valves, an output shaft, and power transmission means for selectively establishing and interrupting power transmission between said output shaft and a load on said engine, the device comprising:

disabling means for selectively holding said at least one of said inlet valve means and said exhaust valve means in a first state wherein part of said valves thereof are inoperative, and in a second state wherein all said valves thereof are operative for alternate closing and opening actions;

transmission state detecting means for detecting whether said power transmission means is in a connected state wherein said power transmission is allowed, or in a disconnected state wherein said power transmission is inhibited; and

control means responsive to an output from said detecting means to cause said disabling means to hold said at least one of said inlet valve means and said exhaust valve means in said first state when said power transmission means is in said disconnected state, irrespective of the rotational speed of said engine.

4,535,733
VARIABLE VALVE TIMING APPARATUS

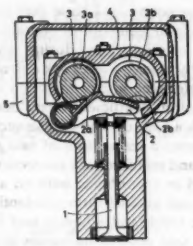
Shoichi Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 376,090, May 7, 1982, abandoned. This application Feb. 12, 1985, Ser. No. 700,327

Claims priority, application Japan, May 15, 1981, 56-72158; May 15, 1981, 56-72159; Jun. 22, 1981, 56-95263; Jun. 22, 1981, 56-95264

Int. Cl.³ F01L *1/34*

U.S. Cl. 123—90.17 **9 Claims**



1. A variable valve timing apparatus for use in a four-cycle internal combustion engine, said engine including intake and exhaust valves each operated by a rocker arm, comprising:

(a) a pair of camshafts extending in parallel with each other, one of said camshafts mounting thereon at least one cam for low speed operation, and the other camshaft mounting thereon at least one cam for high speed operation,

(b) a camshaft holder for supporting said pair of camshafts, said camshaft holder being housed within a cylinder head, each of said camshafts having one end provided with a fixed gear, and said gears of said camshafts being in fixed meshing engagement with each other and being fixed against axial movement relative to each other, said one of said camshafts having an axial extension connected to a shaft drive means; and

(c) means for selectively operating said rocker arm by the selective actuation of at least said high speed cam.

4,535,734
SELF-CONTAINED HYDRAULIC LASH ADJUSTER

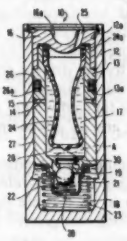
Hisashi Kodama, Nagoya; Tooru Hamamoto, Okazaki; Tetsuomi Tamura, Aichi; Katsujiro Sato, and Kazuharu Yamada, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 9, 1983, Ser. No. 473,421

Claims priority, application Japan, Mar. 9, 1982, 57-32016[U]

Int. Cl.³ F01L *1/24*

U.S. Cl. 123—90.58 **2 Claims**



1. A self-contained hydraulic lash adjuster comprising a cup-shaped cylindrical body having a bore therein open at one end, a plunger having an oil reservoire chamber therein slidably disposed within said body, and defining an oil pressure chamber between the bottom of said plunger and the bottom of said bore, an oil passage provided in said bottom of said plunger to provide fluid communication between said reservoir chamber and said pressure chamber, a check valve operatively associated with said oil passage for permitting oil flow in only one direction from said reservoir chamber to said pressure chamber through said oil passage, a flexible diaphragm secured within said reservoir chamber and a cover means positioned in said reservoir chamber over said oil passage to prevent said oil passage from being closed by said diaphragm upon deformation of said diaphragm wherein said cover means is comprised of a cup-shaped member having an apertured side wall in engagement with said bottom of said plunger and a flat end wall spaced above said oil passage in said bottom of said plunger.

4,535,735
MULTI-GAP SPARK IGNITION SYSTEM

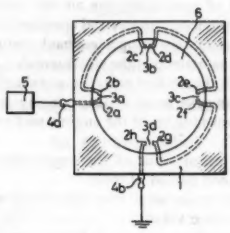
Toru Yoshinaga, Okazaki; Toshihiko Igashira, Toyokawa; Hisasi Kawai, Toyohashi; Seiji Morino, Okazaki, and Norihiko Nakamura, Mishima, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed May 7, 1982, Ser. No. 376,132

Claims priority, application Japan, May 9, 1981, 56-69761

Int. Cl.³ F02P *15/08*

U.S. Cl. 123—310 **1 Claim**



1. A multi-gap spark ignition system to be installed in an internal combustion engine for igniting air-fuel mixture introduced therein, comprising:

a plurality of electrodes which are adapted to be installed in the wall defining a combustion chamber of the engine to form at least three spark gaps therebetween exposed to the chamber;

a high voltage power source which supplies an electric current to said plurality of electrodes for generating breakdown in said spark gaps;

said electrodes being composed of a high voltage electrode which is connected to said high voltage power source, an earth electrode which is earthed, and a plurality of intermediate electrodes which are positioned between said high voltage electrode and said earth electrode;

said electrodes projecting into said combustion chamber to form said spark gaps between two projecting ends of adjacent two electrodes with said electrodes being arranged in series through said spark gaps and said projecting ends being in the shape of the Letter L with said ends of adjacent electrodes being opposed;

said electrodes being buried within an insulating plate which is adapted to be interposed between a cylinder block and a cylinder head of the internal combustion engine;

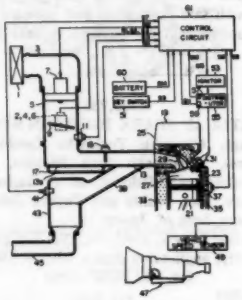
said insulating plate being provided with a central hole to define one portion of the combustion chamber with one end of each electrode projecting into said hole; and

the length of said spark gaps gradually increasing from the high voltage power source side towards the earth side.

4,535,736
METHOD AND APPARATUS FOR CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Mitsuharu Taura, Toyota, and Toshiaki Mizuno, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 17, 1984, Ser. No. 601,341
Claims priority, application Japan, Apr. 18, 1983, 58-68174
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—344 **11 Claims**



1. A method of controlling the air-fuel ratio of an air-fuel mixture to be supplied to an internal combustion engine having an injector by selectively using a feedback control in which the air-fuel ratio is maintained at the stoichiometric level and a lean control in which the air-fuel ratio is maintained at a leaner side of the stoichiometric level at least during an idling of the engine after a warming up of the engine, said method comprising the steps of:

calculating a mean value of the engine idling speed for a predetermined period of time;

comparing the mean value thus calculated with a predetermined reference value;

prohibiting said lean control at least when said comparing step determines that the mean value is less than the predetermined reference value, whereby the air-fuel ratio is feedback-controlled with said feedback control so as to be maintained at the stoichiometric ratio;

computing a basic fuel injection time duration corresponding to a fuel injection rate of said injector in accordance with an engine speed and a load on the engine; and

correcting said basic fuel injection time duration in the lean control by at least a lean correction coefficient and in the feedback control by at least a feedback correction coefficient to thereby determine a final injection time duration, said lean correction coefficient being determined in accordance with a load on the engine such that the air-fuel ratio is in a leaner side of the stoichiometric air-fuel ratio, and said feedback correction coefficient being determined in accordance with the actual air-fuel ratio such that the air-fuel ratio substantially becomes a stoichiometric level, wherein when the result of said comparing step is that the mean value is less than the predetermined reference value, a correction of the basic injection time duration by the lean correction coefficient is prohibited.

7. An apparatus for controlling the air-fuel ratio of an air-fuel mixture to be supplied to an internal combustion engine, comprising:

control means for selectively using feedback control to maintain said air-fuel ratio at a stoichiometric level and using lean control to maintain said air-fuel ratio at a leaner side of said stoichiometric level at least during idling of said engine after a warming up of said engine;

means for calculating a mean value of idling speed of said engine for a predetermined period of time;

means for comparing said mean value with a predetermined reference value;

means for prohibing said lean control operation of said control means when said comparing means determines that said mean value is less than said predetermined reference value, so that said air-fuel ratio is maintained by said feedback control operation of said control means;

an injector for said engine;

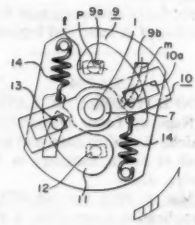
means for computing a basic fuel injection time duration corresponding to a fuel injection rate of said injector in accordance with an engine speed and a load on said engine; and

means for correcting said basic fuel injection time duration during said lean control operation by at least a lean correction coefficient and during said feedback control operation by at least a feedback correction coefficient to thereby determine a final injection time duration, said lean correction coefficient being determined in accordance with a load on said engine such that said air-fuel ratio becomes a leaner side of said stoichiometric air-fuel ratio, and said feedback correction coefficient being determined in accordance with an actual air-fuel ratio such that said air-fuel ratio substantially becomes stoichiometric level; and wherein said means for correcting, when said comparing means determines that said mean value is less than said predetermined reference value, prohibits correction of said basic injection time duration by said lean correction coefficient.

4,535,737
CENTRIFUGAL SPARK-ADVANCE CONTROLLING DEVICE

Akira Takami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 579,953
Claims priority, application Japan, Feb. 18, 1983, 58-26828; Mar. 15, 1983, 58-44859
Int. Cl.³ F02P *5/06*
U.S. Cl. 123—420 **4 Claims**



1. A centrifugal spark-advance controlling device in which a weight is subjected to centrifugal force caused by the revolution of a driving shaft to be opened against the elastic force of a spring member to thereby advance an advancing sleeve with respect to said driving shaft, comprising:

a base plate fixed to said driving shaft, said base plate being provided with an elongated groove for guiding which serves as a guide for said weight to be moved in the direction of opening and an advancing plate fixed to said advancing sleeve,

a position-determining pin extending downwardly from said weight to be engaged with an elongated groove for determining position in an arcuate form formed in said base plate and said elongated groove for guiding is of an arcuate form, said advancing plate being provided with an elongated groove for advancing which determines a relative advance angle of said advancing sleeve with respect to said driving shaft in association with said elongated groove for guiding, wherein said weight is placed between said base plate and said advancing plate and there are

provided on said base plate a cylindrical projection for guiding which is inserted into said elongated groove for guiding to be engaged therewith and a cylindrical projection for advancing which is inserted into said elongated groove for advancing to be engaged therewith.

4,535,738

ENGINE CONTROL SYSTEMS

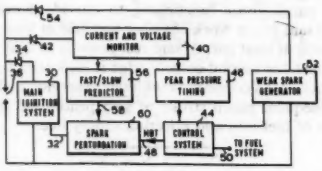
Thomas T. Ma, Sth Woodham Ferrers, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 18, 1984, Ser. No. 621,823

Claims priority, application United Kingdom, Jun. 23, 1983, 8317042

Int. Cl.³ F02P *5/14;* **F02D** *37/02*

U.S. Cl. 123—425 **3 Claims**



1. A method of engine control, characterised by the steps of firing a weak spark through a spark gap between two electrodes of a spark plug in a combustion cylinder of an internal combustion engine, measuring a current through or a voltage across the electrodes following the weak spark, analysing the voltage or current to derive a prediction of a flame propagation speed in the combustion cylinder and subsequently firing a stronger spark through the spark gap to ignite a combustion charge in the combustion cylinder, the stronger spark having an ignition timing varied in dependence upon the prediction of the flame propagation speed, and further including the step of firing several weak sparks in a single engine cycle to obtain several gas velocity readings, the readings being processed to provide by extrapolation an estimate of the gas velocity at the instant of the ensuing stronger spark.

4,535,739

SYSTEM FOR PREVENTING KNOCKING IN A COMBUSTION ENGINE

Ichiro Kudo, Higashikurume; Yoshiaki Kasai, Kiyose, and Masaharu Yuasa, Fujisawa, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,274

Claims priority, application Japan, May 19, 1983, 58-88070

Int. Cl.³ F02P *5/04*

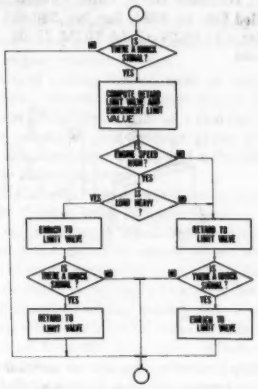
U.S. Cl. 123—425 **6 Claims**

1. A method for preventing knocking in a combustion engine comprising:

sensing conditions of knocking in said engine for producing a knock signal;

computing limit values of retardation of ignition timing and of enrichment of air-fuel mixture in response to said knock signal, with reference to engine speed and amount of intake air;

enriching the mixture to the respective limit value at high engine speed and heavy load and then retarding the ignition timing to the respective limit value; and



retarding the ignition timing to the respective limit value at low engine speed and light load and then enriching the mixture to the respective limit value.

4,535,740

ENGINE CONTROL SYSTEM

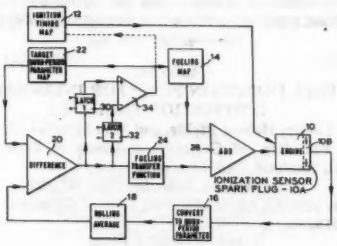
Thomas T. Ma, Chelmsford, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Filed May 31, 1984, Ser. No. 615,632

Claims priority, application United Kingdom, Jun. 3, 1983, 8315221

Int. Cl.³ F02D *37/02*

U.S. Cl. 123—435 **3 Claims**

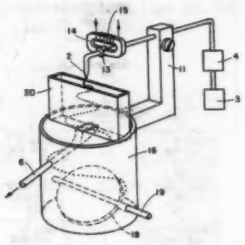


1. An internal combustion engine in which the ignition timing and the fuel-to-air ratio are determined by an open loop control system including tables (12,22,14) stored in a microcomputer, the tables providing signals indicating predetermined settings of the ignition timing and the fuel to air ratio in dependence upon sensed parameters and in which a closed loop control circuit (16,18,20,24) incorporating an ionisation sensor disposed within a combustion chamber is provided for sensing a burn period duration and applying a correction to one of the signals derived from the tables stored in the microcomputer in dependence upon the sensed burn period duration, characterised in that the closed loop applies a correction to the signal for regulating the fuel-to-air ratio and has a response time substantially greater than the response time of the open loop, and in that changes in the correction effected by the closed loop are permitted only when the engine is operating within a predetermined range for which the operation of the ionisation sensor is accurately representative of the burn period duration.

4,535,741
FUEL METERING METHOD AND DEVICE

Carl H. Hertz, Skolbanksvagen 8, Lund, S-223 67, Sweden, assignor to C. Hellmuth Hertz, Lund, Sweden

Filed Feb. 16, 1984, Ser. No. 580,685
Int. Cl.[3] F02N *37/14*; F02M *27/08*
U.S. Cl. 123—444 31 Claims



1. A fuel supply control system for an internal combustion engine said engine having at least one cylinder and operable in conjunction with apparatus to control the flow of air to each of said cylinders comprising:

a. means connectable with said air control apparatus for regulating the flow of air to said engine;

b. at least one chamber being in fluid communication with each of said at least one cylinder;

c. fuel delivery means terminating in an aperture such that said fuel, when forced through said aperture forms a continuous stream;

d. pump means adapted to transfer said fuel under pressure from a reservoir through said fuel delivery means thereby forming said continuous stream;

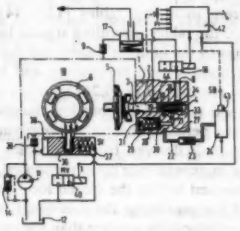
e. control means adapted to control the direction of flow of said continuous stream and to impart to said continuous stream a controlled periodic oscillation and adapted to control the amplitude of said periodic oscillation;

f. receptor means in said at least one chamber for receiving at least a portion of the continuous stream of fuel.

4,535,742
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Helmut Laufer; Helmut Pfeifle, and Max Straubel, all of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,189
Claims priority, application Fed. Rep. of Germany, May 19, 1983, 3318236
Int. Cl.[3] F02M *39/00*
U.S. Cl. 123—447 29 Claims

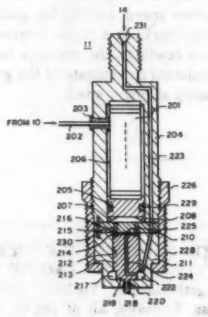


1. A fuel injection pump comprising a housing, a cylinder in said housing, at least one work chamber, in said cylinder, a pump piston enclosing said work chamber in said cylinder, a plurality of fuel injection supply lines in said housing connectable in turn with said work chamber during a pump stroke of said pump piston, a fuel supply conduit in communication with said work chamber during at least part of a rest position of said pump piston between a suction stroke and a pump stroke, a fuel quantity dispensing valve in said fuel supply conduit upstream from said work chamber which has a time controlled opening period, at least one relief conduit in said housing in communication with said work chamber and at least one reservoir, said relief conduit being operably opened up from a predetermined stroke of said pump piston during its pump stroke by a first control edge on said pump piston in synchronism with said pump stroke of said pump piston, said first control edge being formed by a recess disposed on a jacket face of said pump piston which rotates in synchronism with a pump piston drive means, said pump piston being guided within said cylinder thereby simultaneously serving as a fuel distributor, said pump piston having a distributor opening communicating with said pump work chamber, said distributor opening, during rotation of said pump piston, and during a pump stroke registering in turn with one of said fuel injection supply lines thus brought in communication with said work chamber, and at least one second edge on said pump piston, said at least one second edge on said pump piston functioning to provide communication between said pump work chamber and said at least one reservoir during at least part of said rest position of said piston and said at least one second control edge is disposed on said pump piston such that a connection with said reservior is closed prior to a subsequent pump stroke of said piston and prior to an injection of fuel into said injection supply line.

4,535,743
FUEL INJECTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Toshihiko Igashira, Toyokawa; Taro Tanaka, Nagoya, and Yasuyuki Sakakibara, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 9, 1984, Ser. No. 598,436
Claims priority, application Japan, Apr. 15, 1983, 58-65603; Jun. 17, 1983, 58-107954; Aug. 12, 1983, 58-146731
Int. Cl.[3] B05B *1/30*
U.S. Cl. 123—472 22 Claims



1. A fuel injection apparatus for an internal combustion engine comprising:

a nozzle body;

a nozzle formed at the bottom of said nozzle body;

an electroexpansive actuator having an electroexpansive effect;

a valve member, slideably mounted within said nozzle body, for opening and closing said nozzle; and

a fuel chamber formed between said electroexpansive actuator and said valve member;

said electroexpansive actuator and said valve member being disposed so that expansion of said electroexpansive actuator reduces the volume of said fuel chamber, thereby

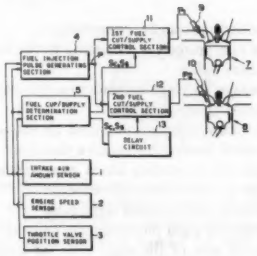
moving said valve member in the closed direction of said nozzle and contraction of said electroexpansive actuator increases the volume of said fuel chamber, thereby moving said valve member in the open direction of said nozzle.

4,535,744

FUEL CUT-SUPPLY CONTROL SYSTEM FOR MULTIPLE-CYLINDER INTERNAL COMBUSTION ENGINE

Ryouichi Matsumura, Ebina, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 9, 1983, Ser. No. 465,198
Claims priority, application Japan, Feb. 10, 1982, 57-18907
Int. Cl.³ F02D *17/00*
U.S. Cl. 123—493 **6 Claims**


1ST FUEL CUT/SUPPLY CONTROL SECTION
2ND FUEL CUT/SUPPLY CONTROL SECTION
FUEL INJECTION PULSE GENERATING SECTION
FUEL CUT/SUPPLY DETERMINATION SECTION
DELAY CIRCUIT
INTAKE AIR AMOUNT SENSOR
ENGINE SPEED SENSOR
THROTTLE VALVE POSITION SENSOR

1. A fuel cut-supply control system for a multiple-cylinder internal combustion engine including a first engine cylinder group provided with a first fuel injection valve group and a second engine cylinder group provided with a second fuel injection valve group and a throttle valve, which comprises:

(a) intake air amount sensing means for detecting the amount of intake air introduced into the engine cylinders;

(b) engine speed sensing means for detecting the revolution speed of the engine;

(c) throttle valve position sensing means for detecting the opening position of the throttle valve to determine whether the engine is being accelerated or idled;

(d) fuel injection pulse generating means responsive to said intake air amount sensing means and said engine speed sensing means for calculating an appropriate pulse width of a fuel injection pulse signal applied to the first and second fuel injection valve groups to supply fuel;

(e) fuel cut-supply determining means responsive to said engine speed sensing means and said throttle valve position sensing means for outputting a fuel out command signal when engine speed is above a predetermined value and the opening position of the throttle valve corresponds to engine idling and a fuel supply command signal when the opening position of the throttle valve does not correspond to engine idling;

(f) delay circuit means responsive to said fuel cut-supply determining means for delaying the fuel cut command signal and the fuel supply command signal to such an extent that the engine vibration caused by the first engine cylinder group is 180 degrees out of phase with that caused by the second engine cylinder group when fuel is cut off or supplied;

(g) first fuel cut-supply control means responsive to said fuel injection pulse generating means and said fuel cut-supply determinating means for applying the fuel injection pulse signal to the first engine cylinder group in response to the fuel supply command signal and interrupting the fuel injection pulse signal in response to the fuel cut command signal; and

(h) second fuel cut-supply control means responsive to said fuel injection pulse generating means and said delay circuit means for applying the fuel injection pulse signal to the second engine cylinder group in response to the delayed fuel supply command signal and interrupting the fuel injection pulse signal in response to the delayed fuel cut command signal,

whereby engine vibration can be reduced in dependence upon destructive interference caused between the first and second engine cylinder groups.

3. A method of cutting fuel off from or supplying fuel to a multiple-cylinder internal combustion engine including a first engine cylinder group provided with a first fuel injection valve group and a second engine cylinder group provided with a second fuel injection valve group and a throttle valve, which comprises the following steps of:

(a) checking whether the engine is being idled by determining if the throttle valve is fully closed;

(b) if the engine is being idled, detecting engine speed and comparing the detected engine speed with a predetermined reference engine speed at which fuel can be cut;

(c) if the detected engine speed exceeds the reference fuel-cut engine speed, setting a delay time to a fuel-cut timer activated when the throttle valve is fully closed and cutting fuel off from the first engine cylinder group;

(d) decrementing the delay time set in the fuel-cut timer;

(e) if the decremented fuel-cut delay time reaches zero, further cutting fuel off from the second engine cylinder group;

(f) if the engine is not being idled, setting a delay time to a fuel-supply timer activated when the throttle valve is opened and supplying fuel to the second engine cylinder group;

(g) decrementing the delay time set in the fuel-supply timer; and

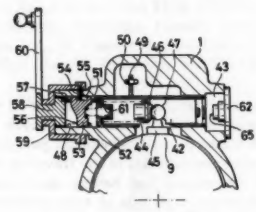
(h) if the decremented fuel-supply delay time reaches zero, further supplying fuel to the first engine cylinder group.

4,535,745

ADVANCE VARIATOR FOR A FUEL INJECTION PUMP

Manuel Roca Nierga, Leghorn, Italy, assignor to SPICA S.p.A., Italy

Filed Feb. 14, 1984, Ser. No. 579,978
Claims priority, application Italy, May 2, 1983, 20879 A/83
Int. Cl.³ F02M *59/20*
U.S. Cl. 123—502 **23 Claims**



1. A fuel injection pump for an internal combustion engine comprising a pump casing (1), means (6, 13-15, 23-35, etc.) for effecting and controlling the fuel throughput of said fuel injection pump, means (9) relatively arcuately adjustable in said pump casing (1) for varying the injection timing of said fuel injection pump, hydraulic actuator means (41) for arcuately adjusting said injection timing varying means (9), said hydraulic actuator means (41) includes a reciprocal piston (42) having first and second opposite end portions opposingly biased by fuel pressure and biasing means (44), respectively; means (45) operatively coupled between said injection timing varying means (9) and said reciprocal piston (42) for arcuately adjusting said injection timing varying means (9) in response to movement of said reciprocal piston (42), a housing (47) within and movable relative to said pump casing (1) housing said reciprocal piston (42), said housing (47) having opposite first and second end portions, said housing second end portion

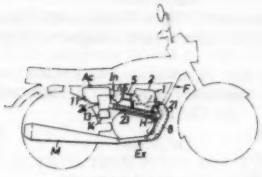
being exposed to fuel pressure in said pump casing (1), a double cam element (53) having first and second cam surfaces (56 and 52, respectively), said double cam element (53) being positioned with said second cam surface (52) adjacent said housing second end portion whereby said housing second end portion is urged into operative relationship with said second cam surface (52) under the resultant pressure of the fuel pressure acting upon said reciprocal piston (42) and said housing second end portion; means (49, 50) for connecting said housing (47) to said fuel throughput effecting and controlling means (6, 13-15, 23-35, etc.) whereby selective movement of said fuel throughput effecting and controlling means (6, 13-15, 23-35, etc.) effects rotary movement of said housing (47) and the position of its operative relationship with said second cam surface (52), and means (57, 60, 64) operative through said first cam surface (56) for shifting said double cam element (53) relative to said housing second end portion thereby shifting said housing (47), said piston (42) and said injection timing varying means (9) through said coupling means (45) to effect a variation in the timing of the commencement of injection pump fuel delivery.

4,535,746

INTAKE AIR HEATING DEVICE FOR INTERNAL COMBUSTION ENGINE FOR MOTORCYCLES

Junji Otani, Oomiya, and Makoto Hirano, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 394,690, Jul. 2, 1982, abandoned. This application Dec. 19, 1984, Ser. No. 683,338
Claims priority, application Japan, Jul. 3, 1981, 56-99308[U]
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—556 **3 Claims**



1. In an internal combustion engine for a motorcycle wherein the engine is mounted on a motorcycle frame, the engine having an intake port and an exhaust port opening at its rear and front sides respectively, in the traveling direction of the motorcycle, the engine also having an air cleaner connected to a carburetor, which is in turn connected to said intake port, and the exhaust port is connected to an exhaust pipe leading to an exhaust muffler which is positioned rearward of the frame, said exhaust pipe having a part which extends downwardly in front of the engine and then along the side of the engine, an intake air heater, comprising:

an air heater means for heating air before entering the intake port, said air heater means having an air heating chamber, disposed around at least part of said exhaust pipe, for heating intake air taken from the external atmosphere through an opening which is provided in the air heater means; and

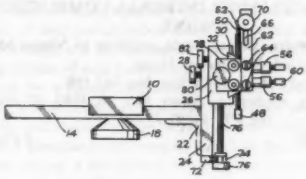
a heated air conduit extending in the longitudinal direction of the motorcycle and passing to the side of the engine cylinder within the transverse breadth of the engine for connection at one end thereof to the air heating chamber at a portion thereof located within the transverse breadth of the engine and at the other end to one side of the air cleaner.

4,535,747

BOWSIGHT FOR COMPOUND ARCHERY BOWS

Donald S. Kudlacek, 3412 Oak St., Longview, Wash. 98632

Filed Mar. 17, 1983, Ser. No. 476,057
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—87 **14 Claims**



1. An archery bowsight, comprising:

(a) a base configured for mounting to the handle member of an archery bow,

(b) a windage carriage mounted on the base for horizontal movement relative thereto,

(c) an elevation carriage mounted on the windage carriage for vertical movement relative thereto,

(d) a sight pin mounting block mounted on the elevation carriage for movement therewith,

(e) a plurality of elongated sight pins,

(f) a plurality of sight pin mounting members each mounting a different one of the sight pins for longitudinal adjustment relative to its associated mounting member, and

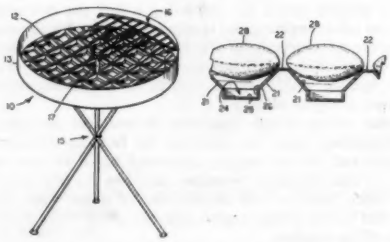
(g) an elongated pin mount support on the sight pin mounting block for supporting the sight pin mounting members for adjustment therealong with the elongated sight pins mounted on the sight pin mounting members for longitudinal adjustment in the direction perpendicular to the pin mount support.

4,535,748

CHARCOAL GRILL

Moritz H. Hunerwadel, 2186 Collins Dr., NW., Atlanta, Ga. 30318

Filed Aug. 27, 1984, Ser. No. 644,613
Int. Cl.³ A47J *37/00*
U.S. Cl. 126—25 R **3 Claims**

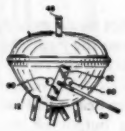


1. A charcoal grill having a solid sheet metal bowl member formed with a set of indentations in which charcoal briquettes may be individually placed, burned and the ashes therefrom collected and with each of said indentations having four inclined flat walls upon which a rounded charcoal briquette may be supported at a plurality of contact points which walls incline downwardly from an indentation lip to four upright walls of a sump in which fluids and ashes may be collected, and a wire mesh grill member supported above said bowl.

4,535,749
PORTABLE BARBECUE GRILL

Erich J. Schlosser, Lindenhurst, and James C. Stephen, Arlington Heights, both of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Aug. 10, 1984, Ser. No. 639,951
Int. Cl.[3] F24C 5/04
U.S. Cl. 126—25 R 12 Claims



1. A portable barbecue grill unit comprising a grill body defining an open top fire chamber having vent openings below said top, a cover for closing said fire chamber, vent closures for said vent openings and a carrying handle for said unit, the improvement of said carrying handle being pivoted on said body and having said vent closures secured thereto and movable therewith, said carrying handle having a first position locking said cover on said body with said vent closures covering said vent openings in said position and a second position where said cover is removable and said vent openings are uncovered.

8. A portable barbecue grill comprising a generally semi-hemishperical bowl having an open top with said bowl having support means thereon and a cover for said open top, said cover having a generally U-shaped gripping handle with a base and a pair of spaced legs secured to said cover, the improvement of a locking bar having opposite ends pivoted about diametrically-opposed fixed pivots on said bowl and having an open position located below said open top and a locked position wherein said locking bar extends across the base to lock said cover to said bowl, said base of said gripping handle having a recess receiving said locking bar in said locked position so that said gripping handle on said cover can be grasped when said locking bar is in said locked position to transport said grill.

4,535,750
BROILER OVEN

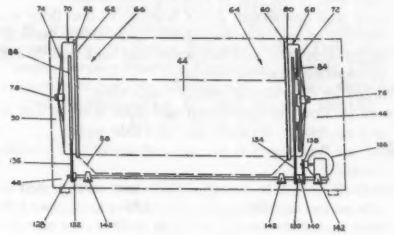
Philip J. Hebert, Barrie, and Leon G. Blanchette, Mississauga, both of Canada, assignors to LeBlanco Limited, Oakville, Canada

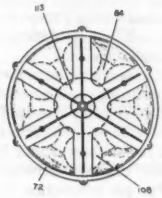
Filed Sep. 9, 1983, Ser. No. 531,481
Claims priority, application Canada, Sep. 1, 1983, 435909
Int. Cl.[3] A47J 37/00, 37/04
U.S. Cl. 126—41 B 12 Claims

1. A broiler oven comprising an elongated cooking compartment, first and second rotisserie drive drums, and a dual drive unit;

said cooking compartment defined by top, bottom, front and rear walls, at least one of which includes a door, and first and second end walls each including a large circular opening therethrough; said compartment including at least one heating unit in an upper part thereof and being substantially unobstructed below said heating unit;

said first and second rotisserie drive drums each having a spit support disc of diameter just less than said circular openings and being mounted for rotation on respective first and second axially aligned shafts centrally mounted in respective ones of said circular openings, said shafts not penetrating substantially into said compartment; each said drum having a series of spit sockets extending through and mounted for rotation in the said discs, said sockets being equispaced around a circular axis on said discs, and individual ones of





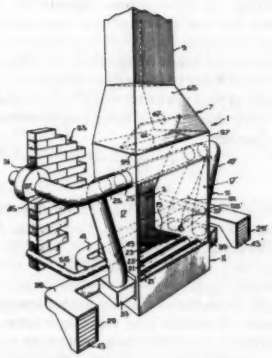
said sockets in said first disc being axially aligned with corresponding ones of said second disc; the sockets in said first disc being driven in rotation by a set of planetary gears;

and wherein said dual drive unit is located outside said cooking compartment and is operatively connected to drive said first and second shafts.

4,535,751
HEAT RECUPERATOR FOR FIREPLACE

Jean-Louis Bourgeois, Duvernay, Canada, assignor to Foyer d'Aciernergie Inc., St. Vincent de Paul Laval, Canada

Filed May 14, 1984, Ser. No. 610,122
Int. Cl.[3] F24B 7/00
U.S. Cl. 126—121 16 Claims



1. A forced air space heating fireplace for heating a room, said fireplace comprising:

(a) a metal casing defining a combustion chamber having an opening facing said room to be heated, said casing comprising:

top wall means having a flue connection for the exit of gas from said combustion chamber;

lower wall means defining an enclosure closed at the top by a floor wall for the support of a grate;

a pair of side walls connected, at the bottom, to said floor wall and, at the top, to said top wall means;

a back wall connected, at the bottom, to said floor wall, at the top to said top wall means and, along vertical side edges thereof, to said side walls, said back wall facing said combustion chamber opening;

(b) forced air flow circuit means comprising:

lower air flow tubes, beneath said floor wall, in and across said enclosure, between said said side walls;

upper air flow tubes at the top and across said combustion chamber;

lateral air flow tube means outside said casing, said lateral tube means interconnecting said lower and upper tubes to form therewith a single air flow path having one air inlet and a pair of air outlet, said air outlets opening on either side of said casing, outwardly thereof, to face said room to be heated whereby to discharge heated air thereinto;

means surrounding said casing except for said combustion chamber opening and said air outlets and enclosing said lateral air flow tube means, and

(c) a blower connected to said air inlet to force air through said air flow path and out through said air outlets into said room to be heated, said blower being disposed to draw air from outside said room to be heated, wherein said upper air flow tubes are exposed to radiant heat from a fire in said combustion chamber and are disposed between said combustion chamber and said flue gas connection so as to be also exposed to convection heat from combustion gases produced by said fire,

wherein said lower air flow tubes comprise at least one forward tube and two rearward tubes and said upper air flow tubes comprise two air flow tubes, said lateral air flow tube means comprising:

a pair of forward plenum boxes each on one of said casing side walls and in said casing surrounding means, said forward tube being operatively connected, at the ends thereof, to said forward plenum boxes;

a rearward plenum box on one of said casing side walls and in said surrounding means, said rearward plenum box being operatively connected to adjacent ends of said rearward tubes;

a pair of outlet air tubes each connected at the ends thereof respectively to the other end of one of said rearward tubes and to one of said air outlets;

interconnecting air flow tubes respectively joining said blower and one end of one of said upper tubes; the other end of said one of said upper tubes and one of said forward plenum boxes; the other of said forward plenum boxes and one end of the other of said upper tubes, and the other end of the other of said upper tubes and said rearward plenum box, whereby said air flow tubes circumscribes said combustion chamber.

4,535,752

FIREPLACE CROSS-CIRCULATING AIR HEATER

Bunyan B. Cagle, 1700 Towson Ave., Fort Smith, Ark. 72901

Filed Sep. 13, 1982, Ser. No. 417,708

Int. Cl.³ F24B 7/00

U.S. Cl. 126—121 **6 Claims**

1. A fireplace cross-circulating air heater comprising

a first plurality of parallel heat exchanger tubes,

a second plurality of parallel heat exchanger tubes,

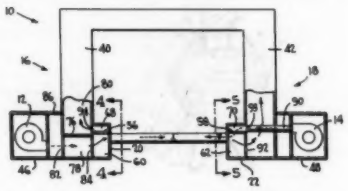
said first and second plurality of tubes being disposed coplanar with a horizontal plane and adapted to extend horizontally across a fireplace,

left and right blowers,

left duct means for directing air from the left blower to left ends of and through said first plurality of tubes,

right duct means for directing air from the right blower to right ends of and through said second plurality of tubes,

said left duct means including left chambers means receiving air from the left ends of said second plurality of tubes for delivery to a room, and



said right duct means including right chamber means receiving air from the right ends of said first plurality of tubes for delivery to the room,

said left and right blowers providing input air from opposite sides of the heater and said left and right chamber means delivering output air to reverse opposite sides of the heater.

4,535,753

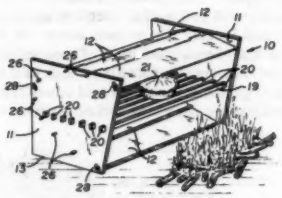
RADIANT HEAT COLLECTOR

Leo Zayauskas, 9327 S. Hamilton Ave., Chicago, Ill. 60620

Filed Apr. 12, 1984, Ser. No. 599,516

Int. Cl.³ A21B 1/00

U.S. Cl. 126—274 **16 Claims**



1. A radiant heat collector for collecting radiant heat from an elongated heat source, and distributing it to a load, comprising:

means for defining an elliptical segment concave cylindrical surface, which cylindrical surface is approximately that developed by a straight line generatrix and a directrix that is a portion of an ellipse, said surface being formed to reflect radiant heat;

means for positioning said developed cylindrical surface means in relation to the elongated heat source such that said heat source is located along one focus line of the elliptical segment cylindrical surface; and

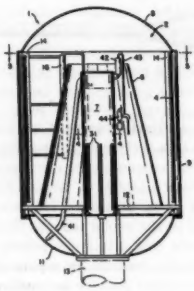
means for holding the load in proximity to the other focus line of the elliptical segment cylindrical surface;

whereby radiant heat generated by the source is reflected by said surface and concentrated at the other focus line and substantially distributed to the load.

4,535,754
MANUFACTURED FUEL ASSISTED SOLAR HEAT EXCHANGER

Harry W. Darr, Kirkland, Wash., assignor to D&M Investments, Yakima, Wash.

Continuation-in-part of Ser. No. 236,691, Feb. 23, 1981, abandoned. This application Feb. 14, 1983, Ser. No. 466,071
Int. Cl.³ F24J 3/02
U.S. Cl. 126—419 8 Claims

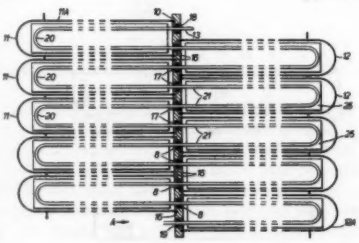


1. A solar energy collector system comprising
means for absorbing solar energy, including a cylindrical coil for containing a heat absorbing fluid;
means for reflecting solar radiation onto said coil, including a plurality of reflective surfaces connected in a frustro-conical configuration within and substantially coaxial with said coil, and;
a housing enclosing said coil, said housing having an exterior surface which is transparent to solar radiation, and an interior surface which is reflective of solar radiation.

4,535,755
SOLAR ENERGY COLLECTOR

Griffith T. Roberts, Maes yr Haul, Cross Inn, Llantrisant, Mid-Glamorgan, Wales

Filed Mar. 5, 1984, Ser. No. 586,360
Claims priority, application United Kingdom, Mar. 5, 1983, 8306016
Int. Cl.³ F24J 3/02
U.S. Cl. 126—443 5 Claims

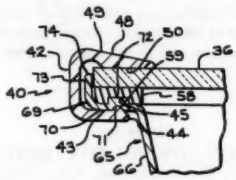


1. A solar energy collector, comprising a manifold base, a plurality of separately formed vacuum vessels positioned on and sealed to said manifold base, each said vessel having a wall which is capable of transmitting solar energy, the interiors of said vessels being interconnected via passages through said base to provide a continuous vacuum path through the vessels, and a conduit for a heat exchange medium extending in a zig zag path through said manifold base, and within each of said vessels and in which the vessels each have one closed end, and the other ends of said vessels are sealed to said manifold base, some of said vessels being disposed on one side of said base and others of said vessels being disposed on the other side of said base, the vessels on one side of said base being staggered and partly overlapping the vessels on the other side of said base, and said conduit passes directly from one vessel on one side of said base into the next adjacent vessel on the other side of said base.

4,535,756
SOLAR COLLECTORS

James W. Rinehart, Melbourne, Fla.; Frank W. Gilleland, Toledo, and Byron W. Engen, Sylvania, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 334,016, Dec. 23, 1981, abandoned. This application Dec. 27, 1983, Ser. No. 565,131
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 6 Claims

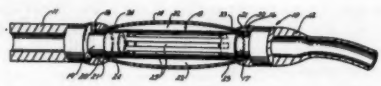


1. A solar collector assembly comprising:
an absorber means adapted to transfer heat to a fluid moving therealong;
a glass cover member adapted to transmit solar energy therethrough;
a housing adapted to contain said absorber means, said housing having a collar section extending around the periphery thereof having a ledge extending laterally outward from the housing;
sealing means located intermediate the ledge and the cover; and
a plurality of plastic, tubular spring clips positioned along the collar section to substantially uniformly bias the cover member toward the ledge at the sealing means to provide a seal between the cover and the housing, said spring clips having a means for securing the clip to the collar section, said spring clip having a plastic interior surface in direct, pressured contact with said glass cover and an upper surface angled from said interior surface to define a third section of said spring clip, said third section presenting a low edge profile effected to promote self-cleaning of snow that accumulates on the cover member.

4,535,757
AUTOINFLATABLE CATHETER

Wilton W. Webster, Jr., 1388 Crest Dr., Altadena, Calif. 91001

PCT No. PCT/US82/00319, § 371 Date Apr. 26, 1982, § 102(e) Date Apr. 26, 1982, PCT Pub. No. WO83/03204, PCT Pub. Date Sep. 29, 1983
PCT Filed Mar. 12, 1982, Ser. No. 371,727
Int. Cl.³ A61M 25/00, 29/00
U.S. Cl. 128—1 D 15 Claims



1. An autoinflatable catheter comprising:
a. an elongated first catheter tube section having open anterior and posterior ends forming a main catheter body;
b. a short second catheter tube section having open anterior

and posterior ends forming a catheter tip having a smaller cross-sectional area at its anterior end than at its posterior end;

c. a balloon support comprising a rigid cage having an open anterior end connected to the posterior end of the catheter tip, an open posterior end connected to the anterior end of the main catheter body and a continuous hollow interior forming an unobstructed pathway between the main catheter body and the catheter tip, said cage having openings through the cage intermediate the cage ends for the flow of a liquid between the interior of the cage and the balloon chamber formed between the cage and a balloon positioned in a surrounding relation to the cage, said openings being sufficiently large not to significantly restrict the flow of a liquid through the openings and to prevent pooling of liquid in the balloon chamber; and

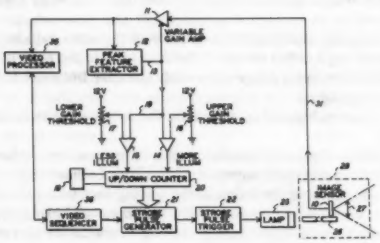
d. an inflatable and deflatable balloon surrounding the balloon support having an anterior end sealed about the posterior end of the catheter tip and a posterior end sealed about the anterior end of the main catheter body.

4,535,758

SIGNAL LEVEL CONTROL FOR VIDEO SYSTEM

Andrew Longacre, Jr., Skaneateles, N.Y., assignor to Welch Allyn Inc., Skaneateles Falls, N.Y.

Filed Oct. 7, 1983, Ser. No. 540,137
Int. Cl.³ A61B 1/04
U.S. Cl. 128—6 **12 Claims**



1. An automatic signal level control for use in a video system wherein a solid state image sensor records light images of a remote target and provides video signals indicative of the target information that includes

a variable gain amplifier for adjusting the level of the video signal delivered to the video processor,

an automatic gain control circuit for sensing the level of the video signal output of the amplifier and providing a feedback signal to the amplifier for maintaining the level of the said video signal within an optimum range,

a strobe lamp for illuminating a target within the viewing range of the sensor, said lamp having a programmable lamp drive for adjusting the pulse rate of the lamp to control the amount of illumination falling on the target during each imaging sequence,

a comparator means for sensing the level of the feedback signal in the gain control circuit and providing a first output signal when the gain level falls below a lower threshold level and a second output signal when the gain level rises above an upper threshold level, and

control means responsive to the comparator means output for programming the lamp drive to increase the pulse rate when the gain exceeds the upper threshold level and to decrease the pulse rate when the gain falls below the lower threshold level whereby the video signal level is maintained within the desired optimum range.

4,535,759

ULTRASONIC MEDICAL INSTRUMENT

Todd J. Polk, Holland, and James F. Morrin, Philadelphia, both of Pa., assignors to Cabot Medical Corporation, Langhorne, Pa.

Filed Sep. 30, 1982, Ser. No. 431,197
Int. Cl.³ A61H 23/00
U.S. Cl. 128—24 A **5 Claims**

1. An ultrasonic medical instrument for providing access to an interior portion of a body comprising the combination of:

a. an elongated probe adapted to be introduced into the body;

b. an ultrasonic driver adapted to vibrate the probe along its longitudinal axis at an ultrasonic frequency, whereby the vibration applied to the probe reduces friction between the probe and the body, said driver comprising a back-up piece, a pair of piezo-electric transducers separated by an electrical conductor and arranged positive to positive, a director, and means for compressing said back-up piece, transducers and director into intimate contact with each other,

c. a frequency regulator connected for maintaining the vibration frequency of the instrument at or near the resonant frequency of the instrument, said regulator including an automatic frequency sensing circuit connected and arranged to detect the resonant frequency of the probe, and means responsive to a signal from said circuit to bring the instrument to its resonant frequency; and

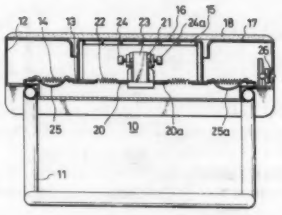
d. means forming a hollow core extending lengthwise through all of said back-up piece, transducers, director and probe to permit the introduction of therapeutic agents or the application of suction through the probe.

4,535,760

VIBRATORY MASSAGE APPARATUS

Shigayuki Ikeda, and Takafumi Hamabe, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 28, 1983, Ser. No. 461,999
Claims priority, application Japan, Feb. 16, 1982, 57-24197
Int. Cl.³ A61H 1/00
U.S. Cl. 128—33 **1 Claim**



1. A vibratory massage apparatus comprising

a support means;

treating means elastically supported on said support means for treating the user's affected body part;

vibration generating means held on the support means and including a motor for generating a vibratory motion which is transmitted to said treating means;

a vibratory plate carrying said treating means;

first spring means elastically coupling said vibratory plate to said support means;

second spring means elastically coupling said vibration generating means to said vibratory plate;

said vibratory plate, said vibration generating means and said first and second spring means defining a vibration system in which said vibratory plate is vibrated at a frequency close to a natural frequency of said vibration system; and

a controlling means electrically connected to said motor for controlling said vibratory motion by cyclically varying its vibration amplitude;

said controlling means including a first means for actuating said motor to produce a vibratory motion at a relatively smaller amplitude, a second means for actuating said motor to produce vibratory motion at a relatively larger amplitude, and means for actuating said first and second means immediately succeedingly and for imposing a halt period of zero amplitude immediately following the actuation of said second means to produce cyclical vibratory pattern comprising immediately succeeding periods of smaller, larger and zero vibratory amplitudes.

4,535,761

GUM MASSAGER

Lewis Rabinowitz, Glendale, Ariz., assignor to Arnell Inc., Glendale, Ariz.

Filed Jun. 24, 1982, Ser. No. 391,530
Int. Cl.³ A61H 7/00
U.S. Cl. 128—62 A **6 Claims**

1. Apparatus for massaging gums, comprising in combination:

(a) handle means for manipulation of the apparatus;

(b) a substantially rigid massaging means arranged for insertion between the teeth of a user of the apparatus; and

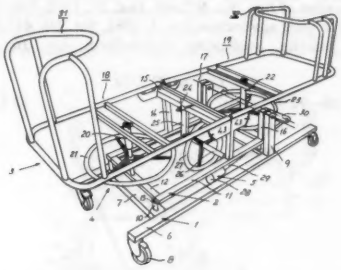
(c) a universal joint coupling means interconnecting said handle means and said massaging means so that said massaging means normally extends perpendicularly from said handle means, said universal joint coupling means being cooperatively formed by a bore means provided transversely in said handle means and an axially extending shank and an enlarged head provided on said massaging means, said shank extending through the bore means of said handle means and being of slightly reduced diameter in relation to the bore means of said handle means to allow a free changing of the angular relationship between said massaging means and said handle means and to allow a swivel-like movement to be imparted to said massaging means upon insertion of said massaging means between the teeth of the user and upon manipulation of said handle means.

4,535,762

MECHANICAL BIO-FEED-BACK AUTO-TRACTION BENCH

Emil J. Natchev, Upplandsgatan 50, S-113 28 Stockholm, Sweden

Filed Aug. 8, 1983, Ser. No. 521,357
Claims priority, application Sweden, Apr. 6, 1983, 83018937
Int. Cl.³ A61F 5/00
U.S. Cl. 128—71 **14 Claims**



1. A traction bench for the traction treatment of spinal conditions of human beings, comprising:

a lower frame;

a bench frame pivotally connected to the lower frame for rotation about a transverse axis adjacent an end of the bench frame;

a support frame carried by the bench frame and divided into an upper body section and a lower body section which meet at a central portion of the support frame, each of said upper body section and lower body section being connected to the bench frame in the vicinity of said central portion by a pivot axis providing pivotal movement of each section independently of the other relative to the bench frame,

a support bed carried by the support frame for receiving a patient to be treated, said support bed having a head part on the upper body section of the support frame and a foot part on the lower body section of the support frame;

means for rotating the upper body section about its said pivot axis to raise or lower that portion of the patient's body supported thereby;

means for rotating the lower body section about its said pivot axis to raise or lower that portion of the patient's body support thereby;

whereby the pivotal adjustments of the upper body section and the lower body section allow either of said sections to be inclined upwardly from the central portion to the opposite end thereof, with the other of said sections inclined downwardly from the central portion to the opposite end thereof to arrange the support frame and support bed inclined either upwardly or downwardly from the said opposite end of the upper body section to the said opposite end of the lower body section;

means for mounting at least one of said upper body or lower body sections for rotation about a longitudinal axis to impart torsional movement to the body of a patient thereon and means for rotating said at least one section about said longitudinal axis;

means for rotating the bench frame about said transverse axis for elavating one end of the bench frame to elevate the corresponding end of the support frame and support bed for traction treatment of a patient thereon by a gravational force;

said means for raising the bench frame, said means for pivoting at least one of the upper body or lower body sections and said means for rotating one of said sections about a longitudinal axis all being operable independently of each other, to permit the body of a patient carried by said

bench to adjust to different angular and torsional positions during different relevant positions of the upper body and lower body sections relative to each other and during different elevations of the bench frame relative to the lower frame.

4,535,763

EXTERNAL BONE-ANCHORING ELEMENT

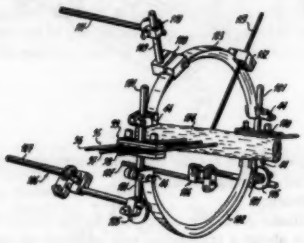
Henri Jaquet, Le Grand Saconnex, Switzerland, assignor to Jaquet Orthopedic S.A., Switzerland

Continuation of Ser. No. 107,546, Dec. 27, 1979, Pat. No. 4,365,624. This application Sep. 3, 1982, Ser. No. 417,902

Claims priority, application Switzerland, Jan. 16, 1979, 386/79

Int. Cl.[3] **A61F** *5/04*

U.S. Cl. 128—92 A **23 Claims**



1. An external bone-anchoring means comprising:

two groups of pins, each group being comprised of at least one pin, or the like, for retaining a bone portion;

first and second supporting means, each of the first and second supporting means being for supporting the pins of a respective one of the two groups of pins;

at least one assembly rod connected to each of the first and second supporting means for interconnecting the first and second supporting means;

at least one of the first and second supporting means comprising an arcuate member of polygonal cross-section connected to the assembly rod and at least one support piece on the arcuate member for supporting the pins of the respective group on the arcuate member, the at least one support piece being movably connected to the arcuate member, the connection between the arcuate member and the support piece enabling the pins of that group to be supported on the arcuate member anywhere along its length, the support piece comprising jaws having internal recesses adapted to complement at least a portion of the polygonal cross-section of the arcuate member so as to be capable of being pressed onto and immobilized on the arcuate member without being able to rotate about it or move along it.

4,535,764

SURGICAL BONE TIE

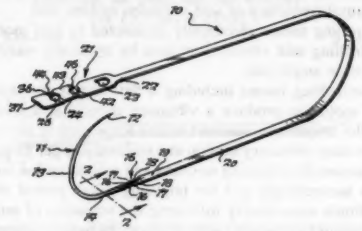
Edward A. Ebert, Snyder, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,449

Int. Cl.[3] **A61B** *17/18*

U.S. Cl. 128—92 B **18 Claims**

17. A surgical bone tie comprising a needle having a leading end for penetrating adjacent bone sections of a bone, a trailing end on said needle, a cutting section of a first cross section adjacent said trailing end of said needle for shaping the holes in the bone sections penetrated by said needle to include the shape of said first cross section, a substantially flat band having a second cross section for fitting within said holes of said first cross section, a leading end on said band secured proximate said cutting section, a trailing end on said band, and a substantially flat locking member having a leading end and a trailing end, said leading end of said locking member being secured to said trailing end of said band, locking means on said locking member for receiving an intermediate portion of said band between said leading and trailing ends of said band in locking



engagement with said locking member, and means operatively associated with said locking means for concealing a free end of said intermediate portion of said band which is produced after said intermediate portion of said band has been severed.

4,535,765

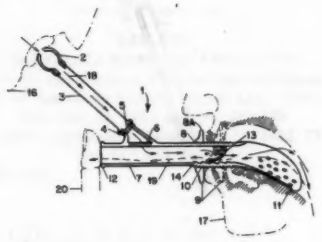
LIFESAVING DEVICE

John A. Paoluccio, 3530 Kiernan Ave., Modesto, Calif. 95356, and Robert Paoluccio, Sacramento, Calif., assignors to John A. Paoluccio, Modesto, Calif.

Filed Jul. 7, 1983, Ser. No. 511,496

Int. Cl.[3] **A61M** *16/00*

U.S. Cl. 128—203.11 **20 Claims**



1. Apparatus for facilitating administration of mouth to mouth artificial respiration to a patient, which comprises:

first, second and third fluid conduits, at least said first and second fluid conduits being axially elongated, each fluid conduit having first and second axial extremities, said first axial extremity of each fluid conduit being connected together and in fluid communication with said first axial extremity of each other fluid conduit;

means for sealing disposed around said second axial extremities of said first and second fluid conduits for cooperation with the respective lips of the patient and the person administering artificial respiration; and

means for substantially preventing back flow of debris into the mouth of a patient, said means comprising a flapper member hingedly mounted in said first fluid conduit to permit free flow in said first conduit from said second to said first axial extremity thereof and having air passageways therethrough to substantially prevent said back flow in the reverse direction.

4,535,766
METHOD AND APPARATUS FOR MONITORING A RESPIRATOR USABLE WITH AN ENDOTRACHEAL TUBE

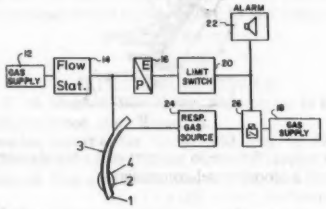
Marcel Baum, Vienna, Austria, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 3, 1983, Ser. No. 463,644

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1982, 3206482

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.23 **10 Claims**



6. Respirator for use with an endotracheal tube, comprising an endotracheal tube having an interior remote end insertable in a person's trachea, a measuring tube connected into the endotracheal tube and termination in an opening at the interior remote end thereof, at least one jet nozzle for respiratory gas connected into said endotracheal tube in the interior thereof adjacent the remote end thereof for discharging respiratory gas into the endotracheal tube for thereby providing a corresponding ambient pressure in the endotracheal tube, a fluid source having a flow control and connected to said measuring tube for supplying a fluid to said measuring tube set at a substantially constant flow rate, a respiratory gas supply having a regulatory switch connected to said at least one jet nozzle and pressure sensor means connected to said measuring tube for directly measuring pressure therein, means responsive to said pressure sensing means and connected to said regulatory switch and effective to shut off the flow of said at least one jet nozzle at a predetermined value of the sensed pressure in said measuring tube, said predetermined value exceeding the corresponding ambient pressure provided by the respiratory gas discharging from said at least one jet nozzle into the endotracheal tube such that in the event of a kinking or otherwise blockage of said measuring tube the pressure therein will in turn at least approximately correspond to such ambient pressure and will increase under the substantially constant flow rate of the fluid supplied thereto until the pressure sensed exceeds said predetermined amount for shutting off the flow of said at least one jet nozzle.

4,535,767
OXYGEN DELIVERY APPARATUS

Brian L. Tiep, 632 Norumbega Dr., Monrovia, Calif. 91016; Robert E. Phillips, 12217 Iredell St., Studio City, Calif. 91601, and Ben A. Otsap, 7661 Airport Blvd., Los Angeles, Calif. 90045

Filed Oct. 1, 1982, Ser. No. 432,187

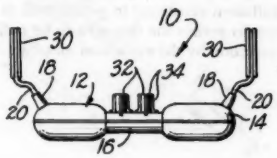
Int. Cl.³ A61M *16/00*

U.S. Cl. 128—207.18 **7 Claims**

1. An oxygen delivery apparatus including cannula means for use in conveying gases into and out of the human body through the nostrils, oxygen supply line means for conveying oxygen to said apparatus and inhalation and exhalation responsive flow control means connected to said cannula means and said supply line means for controlling the flow of oxygen to said cannula means as said apparatus is used in which the improvement comprises:

said cannula means being sufficiently small so that they will not close off air flow through the nostrils of the human body,

said flow control means including an elongated receptacle with first and second opposite ends and defining an open sided elongated chamber extending therebetween, said supply line means connected into the interior of said chamber and said cannula means connected to the interior of the chamber, said receptacle further having an elongated diaphragm means formed of flexible material and mounted on said receptacle over said open side thereby enclosing said chamber, said diaphragm means being mounted transversely to said cannula means to move forward and away from said cannula means, said supply line means and said cannula means spaced from one another by said chamber a sufficient distance so that gas flow from said supply line means will be through said enclosed chamber and will be capable by forcing gas from within said chamber out through said cannula means,



said supply line means being connected to said cannula only through the interior of said chamber, said diaphragm means having a side opposite the side adjacent said enclosed chamber communicating with the surrounding atmosphere,

said diaphragm means being sufficiently flexible and responsive to pressures that are developed during inhalation and exhalation so as to receive gas in said chamber during exhalation and to substantially close off the flow of gas between said supply line means and cannula means through said chamber in response to inhalation.

4,535,768
SET OF SURGICAL INSTRUMENTS

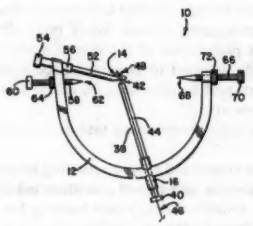
Donald H. Hourahane, Roodepoort, and Angus E. Strover, Halfway House, both of South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Filed Aug. 25, 1982, Ser. No. 411,711

Claims priority, application South Africa, Aug. 26, 1981, 81/5918

Int. Cl.³ A61F *17/32, 5/04*

U.S. Cl. 128—305.1 **15 Claims**



1. A set of surgical instruments suitable for threading a surgical implant in the form of a tow of carbon fibers through a passage formed in a bone, which comprises:

an elongated adaptor having an interior elongated guide formation extending along its length for insertion into a passage in a bone;

a flexible fish wire having a leading end provided with a forwardly tapering and resiliently deformable connector portion; and

a frame for supporting the adaptor, said frame including an extraction member having a passage therethrough and said frame being adapted to position said extraction member so that said passage thereof is in alignment with the interior elongated guide formation of the adaptor,

the fish-wire being insertable, leading end first, along the guide formation of the adaptor when the adaptor is located in a passage in a bone and the connector portion of the fish-wire being deformably insertable in its forward direction through the passage of the extraction member, and being adapted resiliently to spring back into shape with sufficient resistance to withdrawal in the rearward direction to permit the fish-wire to be pulled in the forward direction by the extraction member.

4,535,769

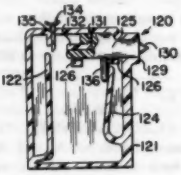
AUTOMATIC RETRACTABLE LANCET ASSEMBLY

James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Division of Ser. No. 322,344, Nov. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 246,523, Mar. 23, 1981, Pat. No. 4,388,925. This application Jan. 20, 1984, Ser. No. 572,339

Int. Cl.³ A61B *17/34*

U.S. Cl. 128—314 **4 Claims**



1. An automatic retractable lancet assembly comprising

a housing having an aperture;

a lancet mounted for movement in said housing with its point lying substantially adjacent the interior side of said aperture;

a first spring mounted inside said housing in a substantially relaxed condition and adapted to be compressed in a biased condition and further adapted to decompress upon release to cause the movement of said lancet point outward of said aperture for penetration of the skin of a patient;

said first spring adapted to become dissociated from further movement of said lancet after said lancet completes its outward movement;

actuating means for compressing said first spring into a biased condition;

latching means connected to said actuating means for retaining said first spring in said biased condition until use;

release means slidable through said housing for releasing said first spring from its biased condition;

said release means including a sharp point for permanently severing said latching means;

a second spring inside said housing in a substantially relaxed condition before said first spring is released and adapted to become biased when said first spring becomes dissociated from further movement of said lancet to cause said lancet point to be automatically retracted back inside said housing.

4,535,770

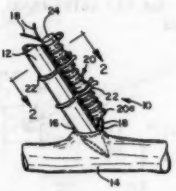
CARDIOVASCULAR TOURNIQUET

Gerald M. Lemole, 404 Tomlinson Rd., Huntingdon Valley, Pa. 19046

Filed Nov. 2, 1983, Ser. No. 547,985

Int. Cl.³ A61M *25/02*

U.S. Cl. 128—327 **8 Claims**



1. A tourniquet for use in support of a cannula operatively inserted into a blood vessel comprising:

a tubular member;

a plurality of protruding members disposed about the outer surface of said tubular member and separated along its length; and

a plurality of clip members adapted to be fastened about the cannula and disposed to engage said tubular member between said protruding members.

4,535,771

CALCULUS DISINTEGRATING APPARATUS

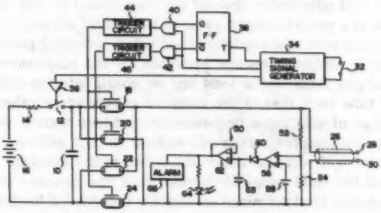
Syuichi Takayama, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1982, Ser. No. 449,699

Claims priority, application Japan, Dec. 22, 1981, 56-206107; Dec. 26, 1981, 56-214252; Jan. 19, 1982, 57-6576

Int. Cl.³ A61B *17/22, 17/36*

U.S. Cl. 128—328 **4 Claims**



1. A calculus disintegrating apparatus, which comprises:

first and second electrodes provided separately from each other;

discharge energy source means including a D.C. power source and a capacitor arranged to be charged by the D.C. power source, wherein said discharge energy source means is connected to said first and second electrodes to apply a D.C. impulse voltage across said first and second electrodes when the capacitor is discharged;

polarity changing means which is connected to said capacitor, and arranged to change the polarity of D.C. impulse voltage applied across said first and second electrodes in response to each discharge of said capatitor;

wherein said polarity changing means comprises a switching circuit connected between said capacitor and said D.C. power source for selectively defining the direction in which charge current flows from said D.C. power source to said capacitor; and

said switching circuit comprises a first switch connected

between one end of said capacitor and the positive terminal of said D.C. power source, a second switch connected between said one end of said capacitor and the negative terminal of said D.C. power source, a third switch connected between the other end of said capacitor and the positive terminal of said D.C. power source, a fourth switch connected between the other end of said capacitor and the negative terminal of said D.C. power source, a first actuator for closing said first and said fourth switches, a second actuator for closing said second and said third switches, and a flip-flop circuit having a trigger input connected to receive switch signals for alternately operating said first and said second actuators in response to each succeeding switch signal applied to said trigger input.

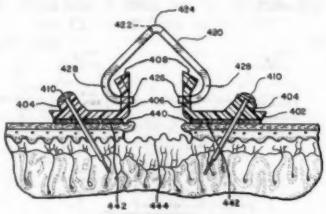
4,535,772
SKIN CLOSURE DEVICE

Joseph C. M. Sheehan, Burr Ridge, Ill., assignor to Kells Medical, Incorporated, Burr Ridge, Ill.

Continuation-in-part of Ser. No. 472,053, Mar. 10, 1983, , which is a continuation-in-part of Ser. No. 367,671, Apr. 12, 1982, abandoned. This application Jun. 3, 1983, Ser. No. 500,854

Int. Cl.³ A61B *17/08*

U.S. Cl. 128—337 **20 Claims**



1. A skin closure device for closing a skin wound which defines first and second wound margins separated by a denuded region, said device comprising:

first and second attachment members;

means for adhesively securing the first and second attachment members to the skin alongside the first and second wound margins, respectively;

means for mechanically securing the first and second attachment members to the skin alongside the first and second wound margins; and

means for interconnecting the first and second attachment members across the wound to adjustably control the separation therebetween through a range of at least 0.5 inches in order to to allow said separation to be reduced gradually and progressively in order to close the denuded region gradually;

said means for adhesively securing and said means for mechanically securing configured such that the attachment members can be adhesively secured to the skin prior to being mechanically secured to the skin.

4,535,773
SAFETY PUNCTURING INSTRUMENT AND METHOD

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Filed Mar. 26, 1982, Ser. No. 362,410

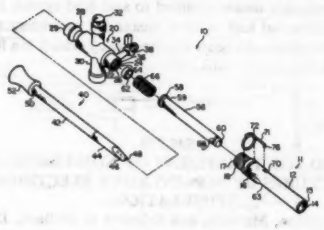
Int. Cl.³ A61B *17/34*

U.S. Cl. 604—51 **55 Claims**

1. A surgical instrument for providing communication through an anatomical organ structure, comprising:

means providing a first lumen for accommodating longitudinal interior passage of a shaft of an elongate implement, said elongate implement having a proximal section exhibiting a transverse cross-sectional dimension greater than the transverse cross-sectional dimension of said shaft and a distal end, said accommodating means including means having an abutment surface for preventing passage of said proximal section through said first lumen;

shielding means providing a second lumen permitting longitudinal interior passage of said elongate implement through said second lumen and having a distal end terminating in a bearing surface open to longitudinal passage of said elongate implement, for reciprocating longitudinally inside said first lumen between said accommodating means and said shaft while said proximal section of said elongate implement is held against said abutment surface; and



means positionable between said accommodating and shielding means for biasing said bearing surface to protrude beyond the distal end of said first lumen and for permitting a section of said shielding means to recede into said first lumen while said proximal section of said elongate implement is held against said abutment surface when said bearing surface is subjected to force along its longitudinal axis, whereby said shielding means obstructs anatomical members from making inadvertent contact with the distal end of said elongate implement when said distal end of said implement is extended beyond said distal end of said first lumen.

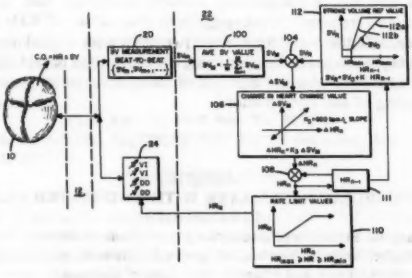
4,535,774
STROKE VOLUME CONTROLLED PACER

Walter H. Olson, North Oaks, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 30, 1983, Ser. No. 509,573

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **6 Claims**



1. A cardiac pacer for the therapeutic stimulation of a heart comprising:

lead system means for coupling said pacer to the patient's heart;

measuring means coupled to said lead for inferring the stroke volume of said heart from the measurement of a physiologic parameter and for producing a measurement indicative of stroke volume;

computation and control means coupled to said measuring means for determining a heart rate value in response to

said stroke volume measurements wherein said heart rate is defined as the V—V interval;

means for comparing the value of said stroke volume measurement with the value of a stroke volume set point for producing a stroke volume difference value;

means for determining a heart rate difference value, wherein said heart rate value is defined as the V—V interval, from said stroke volume difference value;

means for adding said heart rate difference value to the previous heart rate value yielding a current, heart rate value; and

pulse generator means coupled to said lead system and said computational and control means for providing stimulation pulses to said heart at a frequency which is a function of said heart rate value.

4,535,775

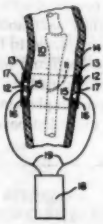
METHOD FOR TREATMENT OF NON-UNION BONE FRACTURES BY NON-INVASIVE ELECTRICAL STIMULATION

Carl T. Brighton, Malvern, and Solomon R. Pollack, Dresher, both of Pa., assignors to Biolectron, Inc., Hackensack, N.J.

Filed Feb. 10, 1983, Ser. No. 465,526

Int. Cl.[3] A61N 1/36

U.S. Cl. 128—419 F 6 Claims



1. A method for the treatment of a bone fracture in a living human body comprising the steps of disposing at least one pair of electrodes in contact with the skin of a living human body in proximity to the bone fracture, supplying to said electrodes an alternating electric signal of symmetrical waveform relative to the axis and of substantially constant amplitude, said signal having a frequency in the range from about 20 to 100 KHz and a value in the range from about two volts peak to peak to ten volts peak to peak, and continuing the application of said signal to said electrodes for a period of time sufficient to produce healing of said bone fracture.

4,535,776

CARDIAC PACEMAKER WITH TWO UNIPOLAR ELECTRODES

Hans G. Strandberg, Sundbyberg, and Hans Andersen, Vaellingby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

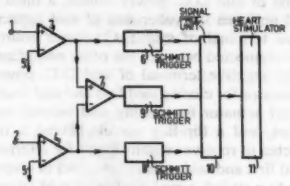
Filed Dec. 12, 1983, Ser. No. 560,712

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247264

Int. Cl.[3] A61N 1/36

U.S. Cl. 128—419 PG 5 Claims

1. In a cardiac pacemaker comprising (a) two unipolar electrodes; (b) one indifferent electrode, (c) a series-connected amplifier and detector coupled to each of said unipolar electrodes, and (d) means for generating and controlling heart stimulation pulses in dependence upon the ouput signals of said detectors; the improvement comprising signal processing means, responsive to said output signals of said detectors, for suppressing the application of said output signals to said means



for generating heart stimulation pulses when both of said detectors produce output signals at substantially the same time.

4,535,777

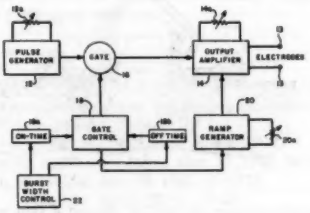
METHOD OF PROVIDING ELECTRICAL STIMULATION OF TISSUE

John C. Castel, Lake Bluff, Ill., assignor to Physio Technology, Inc., Topeka, Kans.

Continuation of Ser. No. 294,715, Aug. 20, 1981, abandoned. This application Sep. 28, 1984, Ser. No. 656,403

Int. Cl.[3] A61N 1/36

U.S. Cl. 128—421 25 Claims



1. A method of providing electrical stimulation of tissue comprising:

generating a continuous train of repetitive pulses having a frequency in the range of 500 Hz to 100,000 Hz;

gating said pulse train to produce an output signal having intervals of continuous pulse train output alternated with intervals of no pulse train output in the frequency range of 0.1 to 200 Hz; and

delivering said output signal through electrodes to a tissue treatment area, said sequence of intervals of the pulse train output signal having a width of each successive interval different than the preceding and successive intervals.

4,535,778

METHOD AND APPARATUS FOR DETECTING BLOOD GAS

Sotiris Kitrilakis, Berkeley, and Theodore R. Johnson, Point Reyes, both of Calif., assignors to Ancet Corporation, Richmond, Calif.

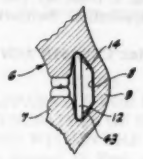
Filed May 13, 1983, Ser. No. 494,534

Int. Cl.[3] A61B 5/00

U.S. Cl. 128—635 9 Claims

1. A blood gas detector comprising a positioning assembly including a flat base plate of approximately elliptical outline and of a thickness adapted to fit within the closed human mouth alongside and against both the upper and lower gums and the inside of the adjacent cheek and of a width to fit against the upper and lower merging portions of the inside of the cheek and the gums, a dome included in said positioning assembly and disposed on and projecting away from said base plate to displace the inside surface of said cheek to lie over said dome, a first sensing electrode disposed at the center of said

dome and adapted to lie close to the inside of said cheek, a second sensing electrode disposed around the center of said dome spaced from and in electrical relationship with said first



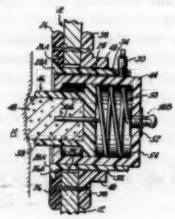
electrode and adapted to lie close to the inside of said cheek, and sensing electrical conductors respectively joined to said sensing electrodes and supported by and extending from said base plate.

4,535,779

TRANSCUTANEOUS ELECTRODE DEVICE FOR CAST-COVERED SITES

Stephen H. Ober, Chaska, Minn., assignor to EMPI, Inc., Fridley, Minn.

Filed Mar. 4, 1983, Ser. No. 472,086
Int. Cl.[3] A61B *5/04;* A61N *1/04*
U.S. Cl. 128—644 **31 Claims**



1. An apparatus for providing electrical connection to anatomical site through an intervening cast which surrounds a portion of a patient's body and overlies and restricts access to the site, the apparatus comprising:

support means adapted to be attached to and supported by the cast in spaced relationship to the site for defining an aperture through the cast; the support means comprising:

aperture defining means for extending through the cast to define the aperture through the cast which is aligned with the site;

first and second cast engaging means extending generally radially outward from the aperture defining means for engaging interior and exterior surfaces of the cast, respectively; and

connection means for connecting the first and second cast engaging means and the aperture defining means in fixed relationship;

an electrode comprising:

a carrier which is insertable into the aperture from outside the cast toward the anatomical site and removable from the aperture by movement away from the anatomical site;

an electrically conductive medium carried at a first end of the carrier for making electrical contact to the anatomical site when the carrier is inserted in the aperture; and

electrical connection means adjacent a second end of the carrier for providing electrical connection to the electrically conductive medium; and

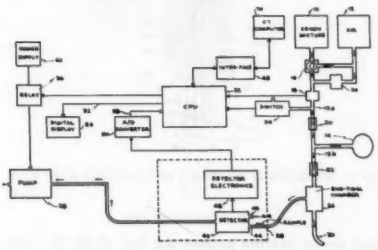
means for releasably holding the carrier in a fixed position with respect to the support means when the carrier is inserted in the aperture.

4,535,780

APPARATUS FOR MEASURING XENON CONCENTRATION IN XENON CEREBRAL BLOOD-FLOW STUDIES

David Gur; John M. Herron, both of Pittsburgh, Pa., and Robert H. Pedersen, Milwaukee, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 7, 1984, Ser. No. 669,136
Int. Cl.[3] A61B *6/00*
U.S. Cl. 128—659 **11 Claims**



1. An apparatus for measuring end-tidal xenon concentration in samples of air exhaled by a patient breathing a xenon-gas-containing atmosphere, said xenon gas concentration measurement being useful in combination with CT X-ray attenuation measurements to reconstruct images containing cerebral blood-flow information, said apparatus comprising:

means for retaining xenon-containing end-tidal air exhaled by the patient;

means for sensing the beginning of the inhalation portions of successive breathing cycles, and providing signals indicative thereof;

thermal conductivity gas-detector means capable of providing an output signal indicative of the concentration of xenon gas in a sample of the exhaled end-tidal air;

pump means for drawing a sample of end-tidal air from said means for retaining; and

control means responsive to each of said signals from said means for sensing to provide an activating signal to said pump means to draw a sample of end-tidal air held in said means for retaining into said thermal conductivity detector for analysis.

4,535,781

MANUALLY OPERATED ULTRASOUND APPLICATOR

Walter Hetz, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,785
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3215529
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—660 **1 Claim**

1. A manually operated ultrasound applicator for scanning tissues and internal organs of a living subject, comprising:

an ultrasound transducer which is mounted in an elongated transducer housing having a scanning surface for placement on a region to be scanned and a bearing bracket mounted to an end thereof and projecting horizontally outwardly therefrom;

an elongated handle, said handle being divided into first and second half shells separated by an elongated slot;

a bearing pin pivotally connecting the bearing bracket to a first end of the handle, said pin being embraced between said half shells and being rotatable therebetween, whereby the housing is pivotable with respect to the handle;

at least one screw extending transversely between said half shells adjacent said bearing pin to create a center of rota-

tion of the handle and to thereby cause said half shells at said first end to act as jaws; and

a sleeve means slidably mounted on the handle on that side of the center of rotation which is opposed to said first end,

said sleeve bearing against the half shells to force them apart and thereby change the spacing between the half shells as a function of its position on the handle, permitting the housing to be locked in position with respect to the handle.

4,535,782

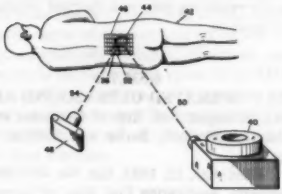
METHOD FOR DETERMINING WOUND VOLUME

Bart J. Zoltan, Old Tappan, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 7, 1984, Ser. No. 586,895

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—665 **10 Claims**



1. A method of determining the volume of a wound comprising:

(a) placing a reference volume of known geometry adjacent a wound,

(b) projecting a pattern of lines onto said wound and unto an area contiguous with said wound,

(c) imaging said wound and said contiguous area from said projecting step, with means for imaging,

(d) obtaining the image from said imaging step,

(e) measuring the area of said image bounded by the projected pattern of the lines on said wound surface, and by the projected pattern of the lines were said wound not present, and

(f) using the areas from said measuring step and said reference volume to calculate said volume of said wound.

4,535,783

PERSONAL ELECTROCARDIOLOGY RECORDER

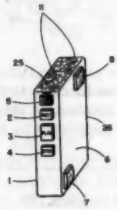
Daniele Marangoni, Milan, Italy, assignor to Kontron Holding A.G., Zurich, Switzerland

Filed Aug. 1, 1983, Ser. No. 518,859

Claims priority, application Switzerland, Aug. 5, 1982, 4717/82

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—711 **17 Claims**



1. A hand-held electrocardiology recorder for recording heart signals of a patient comprising:

(a) a hand-held tape recording means having a casing with at least first and second walls;

(b) a measuring electrode and a reference electrode disposed on the first wall of the casing for contacting the chest of the patient and detecting heart signals;

(c) a grounding electrode disposed on the second wall of the casing such that electrical contact between the patient's chest and the grounding electrode can be made by the patient's hand touching the grounding electrode while the patient's wrist contacts the chest;

(d) amplifier means located within the casing for amplifying the signals detected by the electrodes; and

(e) converter means located within the casing for converting the detected and amplified signals into recordable signals.

4,535,784

APPARATUS FOR STIMULATING ACUPUNCTURE POINTS BY LIGHT RADIATION

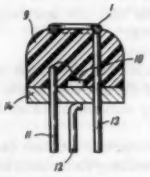
Vojtech Rohlicek; Jaroslav Hruby; Dusan Nohavica; Jan Hrdlicka; Vlastimil Vykouk, and Frantisek Kubec, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation of Ser. No. 431,121, Sep. 30, 1982, abandoned. This application Nov. 29, 1984, Ser. No. 676,220

Claims priority, application Czechoslovakia, Oct. 9, 1981, 7420-81; Oct. 13, 1981, 7477-81; Apr. 22, 1982, 2889-82; May 24, 1982, 3816-82

Int. Cl.³ A61H *39/00*

U.S. Cl. 128—735 **3 Claims**



1. An apparatus for stimulating acupuncture points on the skin of a living subject by light radiation and for detecting acupuncture points on the skin of a living subject by evaluating variations in skin impedance, comprising a light emitting diode and a surface electrode, said surface electrode being mounted

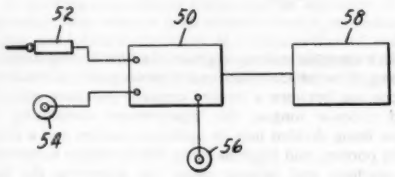
on the surface of the light emitting diode for contact with the skin of the subject, a source of electric current for feeding the light emitting diode, circuit means for electrically connecting the light emitting diode with the source of electric current, and indicator means for evaluating variations in the impedance of skin of the subject at the location engaged by the suface electrode.

4,535,785

METHOD AND APPARATUS FOR DETERMINING THE VIABILITY AND SURVIVAL OF SENSORI-NEUTRAL ELEMENTS WITHIN THE INNER EAR

Christopher van den Honert, St. Paul, and Paul H. Stypulkowski, Vadnais Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Sep. 23, 1982, Ser. No. 421,992
Int. Cl.³ A61B *5/05, 5/12*
U.S. Cl. 128—746 **15 Claims**



1. A method of diagnosing the extent of survival of the peripheral sensori-neural elements with a patient, comprising the steps of:

stimulating the inner ear of the patient with a first electrical stimulus signal and a second electrical stimulus signal having a first predetermined delay with respect to said first electrical stimulus signal;

measuring the electrical activity within the nervous system of the patient which results from said first electrical stimulus signal and said second electrical stimulus signal having a first predetermined delays

then stimulating the inner ear of the patient with said first electrical stimulus signal and said second electrical stimsulus signal having a second predetermined delay with respect to said first electrical stimulus signal;

measuring the electrical activity within the nervous system of the patient which results from said first electrical stimulus signal and said second electrical stimulus signal having a second predetermined delay; and

comparing the electrical activity within the nervous system of the patient which results from said first and second electrical stimulus signals with said first predetermined delay with the electrical activity within the nervous system of the patient which results from said first and second electrical stimulus signal with said second predetermined delay.

4,535,786

MEASUREMENT OF BODY FLUID CHEMISTRY

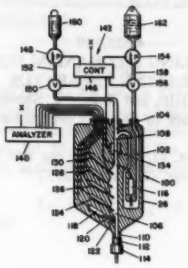
John A. R. Kater, 2037 W. San Lorenzo, Santa Ana, Calif. 92704

Filed Jul. 25, 1983, Ser. No. 516,627
Int. Cl.³ G01N *27/46*
U.S. Cl. 128—760 **10 Claims**

1. The method of measuring a chemical property of a body fluid using a conduit which terminates in a quantity of the body fluid and which incorporates a first electrode selective to said property and a second, reference electrode at spaced points along its length, which method comprises the steps of:

filling said conduit with a quantity of reference fluid sufficiently to subject both of said electrodes to the reference fluid; and

at another time, filling said conduit with a quantity of the reference fluid such that the reference electrode is subjected to reference fluid, and with a quantity of the body



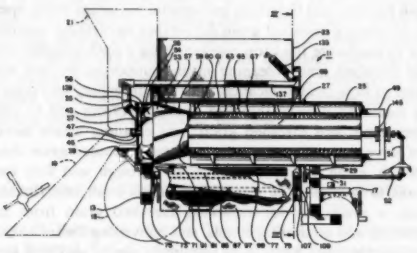
fluid such that the first electrode is subjected to the body fluid.

4,535,787

AXIAL FLOW COMBINE

Mark R. Underwood, Burr Oak, Kans., assignor to Probe Adventures, Inc., Burr Oak, Kans.

Division of Ser. No. 409,294, Aug. 18, 1982, Pat. No. 4,487,733.
This application Jun. 21, 1984, Ser. No. 622,887
Int. Cl.³ A01F *12/18*
U.S. Cl. 130—27 T **5 Claims**



1. In a combine having a frame mounted on wheels, an improved means for threshing and separating grain from crop, comprising:

an outer body mounted on the frame;

an inner body mounted inside the outer body for rotation with respect to the frame, the inner body containing a plurality of slots;

an outer helical flight located between the inner and outer bodies and spiraled for causing grain that has fallen through the slots to move forwardly as the inner body rotates;

a hollow grate mounted at the forward end of the inner body for rotation therewith and having a sidewall containing a plurality of apertures for threshed grain to pass, the grate being frusto-conical with a circular entrance for receiving crop and having a circular exit spaced rearwardly for discharging crop, the entrance of the grate being of larger diameter than the exit;

a threshing drum mounted inside the grate, the threshing drum having a frusto-conical sidewall with a larger forward end than a rearward end;

a beater rigidly mounted to the threshing drum and extending rearwardly through the inner body, the threshing drum and beater being driven in a direction opposite to the direction of rotation of the inner body; and

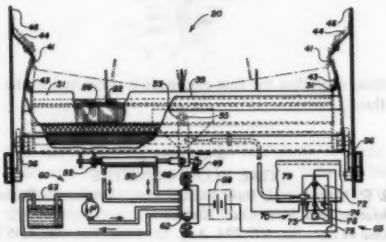
inner flight means mounted inside the inner body for causing crop to move rearwardly for discharge as the inner body rotates.

4,535,788

LATERAL LEVELING MECHANISM FOR COMBINE CLEANING APPARATUS

E. William Rowland-Hill, and Ronald T. Sheehan, both of Lancaster, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Oct. 11, 1984, Ser. No. 659,932
Int. Cl.³ A01F 12/32
U.S. Cl. 130—27 AE 13 Claims



1. In a combine harvester having a mobile frame; threshing and separating means supported by said main frame to thresh crop material fed thereto for separating threshed grain from trash residue, said threshing and separating means being operable to convey threshed grain for further harvesting treatment and to discharge the crop residue along a path separate from said threshed grain; cleaning means supported by said main frame in flow communication with said threshing and separating means to receive threshed grain therefrom and to clean debris from said threshed grain, said cleaning means having first sieve means to permit the passage of cleaned grain therethrough, a fan operable to blow air through said first sieve means to facilitate the removal of debris from said threshed grain, a grain pan for receiving threshed grain from said threshing and separating means, and conveying means to convey said threshed grain from said grain pan to said first sieve means; and drive means for powering the operation of said threshing and separating means and said cleaning means, the improvement comprising:

a subframe supported on said main frame for movement about a generally fore-and-aft extending axis such that said subframe can be tilted in a transverse direction relative to said main frame, said subframe mounting said grain pan and said first sieve means for lateral pivotal movement relative to said main frame without affecting movement of said fan relative to said main frame;

an actuator operably associated with said subframe for selectively controlling the pivotal movement of said subframe to permit said grain pan and said first sieve means to be maintained in a transversely level attitude relative to the ground irrespective of the transverse attitude of said main frame; and

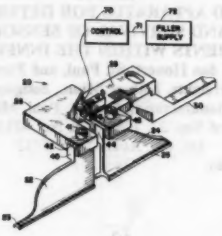
control means operable to sense the transverse inclination of said main frame and control the subsequent operation of said actuator to maintain a transversely level attitude of said actuator to maintain a transversely level attitude of said subframe, said control means including an inclinometer mounted on a transversely extending portion of said main frame and having a first contact member movable in response to gravitational forces when said main frame is laterally inclined and a second contact member movable in response to movements of said subframe.

4,535,789

TOBACCO ROD FIRMNESS SENSOR

Christopher L. Irving, Chesterfield, and Jerome S. Osmalov, Richmond, both of Va., assignors to Philip Morris, Inc., New York, N.Y.

Filed Aug. 2, 1983, Ser. No. 519,605
Int. Cl.³ A24C 5/14
U.S. Cl. 131—84.1 7 Claims



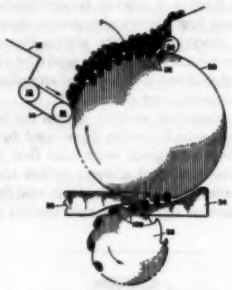
1. In a cigarette making machine of a type having means for forming, from tobacco filler and tobacco paper, a continuous tobacco rod between a tapered concave garniture and a tapered concave tongue, the improvement comprising: the tongue being divided into an upstream portion and a downstream portion; said portions being independently mounted to said machine; and, sensing means for measuring the force exerted on said upstream portion by the filler compressed between said upstream portion and the garniture and for providing an indication of the force.

4,535,790

METHOD AND APPARATUS FOR ALIGNING OVAL CIGARETTE FILTERS

Jack C. Wheless, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 31, 1983, Ser. No. 480,809
Int. Cl.³ A24C 5/32
U.S. Cl. 131—94 13 Claims



1. A cigarette tipping machine comprising: a hopper; feed means for receiving filter plugs of oval cross section from said hopper for presenting the filter plugs at a predetermined point with a predetermined angular orientation; said feed means comprising a plug drum located adjacent said hopper for receiving filter plugs at predetermined locations about the peripheral surface of said plug drum, said plug drum including means for retaining filter plugs thereon at said predetermined locations; said plug drum having a respective flute at each said predetermined location for receiving a filter plug therein within a predetermined seating zone; refuser means for preventing a filter plug received in one said flute but protruding

from the respective said seating zone from leaving said hopper; a plurality of rotating drum means for transporting the filter plugs along a predetermined path from said predetermined point; said rotating drum means each having a plurality of flutes in their peripheral surfaces, each said flute having an oval shape to fit the oval filter plugs with which said machine is to be used; means for supplying oval tobacco rods and aligning them with respective filter plugs; and means for applying tipping material to assemblies comprising a filter plug and a tobacco rod, for securing the filter plug to the tobacco rod.

4,535,791

SMOKING COMPOSITIONS CONTAINING ACYLPYRAZINE ETHER FLAVORANTS

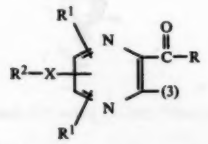
David L. Williams; Everett W. Southwick, and Yoram Houminer, all of Richmond, Va., assignors to Philip Morris Incorporated, Richmond, Va.

Filed Jan. 10, 1984, Ser. No. 569,693

Int. Cl.³ A24B *3/12, 15/38*

U.S. Cl. 131—278 **7 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco, non-tobacco substitutes, and mixtures thereof, and (2) between about 0.00001 and 2 weight percent, based on the total weight of filler of an acylpyrazine ether corresponding to the formula:



where R is a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 2–12 carbon atoms, R^1 is a substituent selected from hydrogen and alkyl groups containing between about 1–6 carbon atoms, X is etheric oxygen or sulfur, and R^2 is a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–12 carbon atoms, with the proviso that the position-(3) substituent is not hydrogen.

4,535,792

APPARATUS FOR TREATING PERFORATED WEBS OF TIPPING PAPER OR THE LIKE

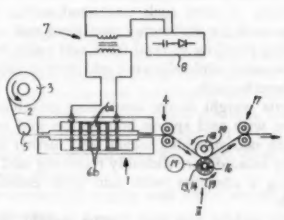
Rolf Lindemann, Oststeinbek, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,394

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205661

Int. Cl.³ A24F *5/60*

U.S. Cl. 131—281 **9 Claims**



1. Apparatus for treating a running perforated web which is advanced along a predetermined path and whose perforations are formed by the application of heat to and resulting burning or charring of portions of the material of the web, comprising a mechanical wiping device adjacent to at least one side of said path and bodily contacting the respective side of the running web; and a back support disposed at the other side of said path opposite said wiping device.

4,535,793

SMOKING ARTICLE FILTERS

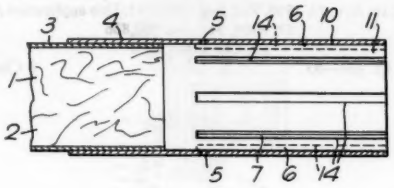
John A. Luke, Eastleigh, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 18, 1983, Ser. No. 514,990

Claims priority, application United Kingdom, Aug. 18, 1982, 8223775

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—336 **8 Claims**



1. A smoking article ventilated filter element comprising a plug of fibrous filtration material wrapped in an air permeable wrapper, a plurality of equiangularly spaced apart grooves extending parallel to the longitudinal axis of the filter element from the mouth end of the element for a distance less than the total length of the element, each groove being defined in the wrapper by a longitudinal strip of wrapper being removed exposing the fibrous material of the plug.

4,535,794

MACHINE HAVING A COIN OR TOKEN PAYOUT MECHANISM

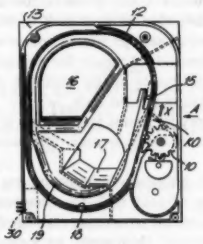
Robert D. Bellis, Nr. Oldham; Timothy W. Tod, Abergavenny, and Roger J. Tod, Crickhowell, all of Great Britain, assignors to Coin Controls Limited, Lancashire, England

Filed Nov. 18, 1982, Ser. No. 442,801

Claims priority, application United Kingdom, Nov. 20, 1981, 8135027

Int. Cl.³ G07D *9/04*

U.S. Cl. 133—8 E **22 Claims**



1. A coin dispensing mechanism comprising a selectably drivable endless loop conveyor whose path includes a bight portion, a store for continuously feeding a supply of the coins to be dispensed into said bight, the conveyor having a plurality of upstanding lips thereon extending obliquely across the width of the conveyor, in parallel relationship and with a

spacing greater than one but less than two coin diameters, the conveyor also having stirrer means thereon for stirring the supply of coins in the bight when the conveyor is driven and causing coins to drop into the spaces between adjacent lips, the entrained coins thence being transported upwardly by conveyor to an exit point above the bight where the coins are fed from the conveyor.

4,535,795

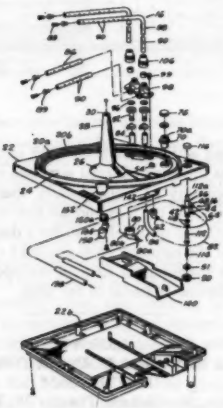
NON-ELECTRIC PORTABLE DISHWASHER

Frank J. P. Taylor, 25301 Cabot Rd., Laguna Hills, Calif. 92653

Continuation-in-part of Ser. No. 441,384, Nov. 12, 1982, Pat. No. 4,444,213, which is a continuation-in-part of Ser. No. 205,710, Nov. 13, 1980, Pat. No. 4,368,747. This application Apr. 23, 1984, Ser. No. 602,836

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—93 **8 Claims**



1. A dishwasher, comprising:

(a) a base;

(b) a closure housing carried by said base;

(c) a rack rotatably mounted within said housing, said rack being adapted to support articles to be washed;

(d) jet means adapted for interconnection with sources of hot and cold water under pressure for directing jets of water in the direction of said rack to impart rotational movement thereto, said jet means comprising:

(1) a first collimated jet means for emitting a collimated stream of cold water in the direction of said rack for initiating rotation of said rack;

(2) a second spray jet means for emitting jets of cold water in the direction of said rack for sustaining rotation thereof;

(3) a third spray jet means for emitting jets of hot water in the direction of said rack for cooperating with said second spray means to sustain rotation of said rack; each of said second and third spray jet means comprising at least one apertured conduit disposed within said closure housing proximate said rack; and

(4) control means for controllably and simultaneously regulating the flow of water between said first collimated jet means and said second spray jet means whereby a stream of cold water can be directed at said rack with sufficient velocity to initiate rotation thereof.

4,535,796

SEISMIC ACTUATED SHUT-OFF VALVE

Johnny Terrones, 13201 Bombay St., Sylmar, Calif. 91342, and Walter E. Kennard, 8333 Columbus Ave., Sepulveda, Calif. 91343

PCT No. PCT/US82/00873, § 371 Date Feb. 10, 1984, § 102(e) Date Feb. 10, 1984, PCT Pub. No. WO84/00200, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 28, 1982, Ser. No. 608,051

Int. Cl.³ F16K *17/36*

U.S. Cl. 137—45 **7 Claims**

1. A seismic actuated shut-off valve for fluid flow conduits comprising:

a. a valve body having an open passageway for passing fluid therethrough having a centrally located plug seat, and a planar threaded opening;

b. a piston plug positioned within said body slideably maintained in alignment with said plug seat for blocking said passageway to impede the flow of fluid;

c. a piston stem fixed to said piston plug on the first end for urging said plug linearly into said plug seat maintaining alignment thereof;

d. a stem link jaw disposed on the second end of said piston stem having a cavity with coarctation when rotated therewith;

e. a stem spring flange fixed to said piston stem at right angles in arcuate fashion between said piston plug and said stem link jaw providing a platform with the superficies at right angles to said piston stem;

f. a spring housing having an internal chamber defining an axial wall, open on each end with the first end containing attaching means to embrace said valve body on the exterior and surround said piston stem distal-proximate the interior creating a chamber to enclose said piston stem along with said stem spring flange and the second end having flange attaching means;

g. a plurality of stem seals contained within said spring housing urgingly embracing said stem and said housing restricting the flow of fluid from said valve body to said spring housing while allowing said stem to slide longitudinally therethrough;

h. an inertia weight flange containing attaching means to interface with said spring housing on said second open end, with said attaching means, and further containing a centrally located bore slideably receiving said piston stem providing a chamber with said stem extending therethrough;

j. an inertia weight arm with inertia weight, link jaw and attaching means having a weight mass on the first end and a link jaw cavity on the second end with coarctation when rotated, being affixed pivotally to said inertia weight flange with attaching means extended therefrom, creating

a lever arm allowing free movement as interacted with external vibratory or shock wave forces; and,

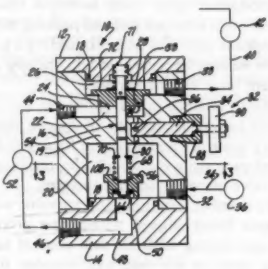
k. a severable tension link disposed between and compressibly engaged within said stem link jaw cavity and said inertia weight link jaw cavity defining a continuous member from said piston plug to said piston spring allowing reactance of said inertia weight to axially rotate under the dominance of a seismic shock wave causing the link to structurally yield, fracture and separate, thus permitting said piston spring to expand between said stem spring flange and said inertia weight flange linearly urging said piston plug into said valve body plug seat obstructing the flow of fluid therethrough.

4,535,797

AUTOMATIC SHUT OFF VALVE

Nils O. Rosaen, Norco Products, Inc., 2139 Heide, Troy, Mich. 48084

Filed Aug. 17, 1983, Ser. No. 523,926
Int. Cl.³ F16K *17/10*
U.S. Cl. 137—87 **6 Claims**



1. An automatic shut off valve comprising:

a housing having a main inlet, a main outlet, a user inlet and a user outlet,

first fluid passage means for fluidly connecting said main inlet to said user outlet, said first fluid passage means having a first port at a midpoint,

second fluid passage means for fluidly connecting said user inlet to said main outlet, said second fluid passage means having a second port at a midpoint,

said first and second ports being coaxial and axially spaced from each other,

valve means movable between an open and closed position for simultaneously opening and closing said ports in first and second fluid passage means,

said valve means comprising an elongated valve stem extending axially between said ports and axially slidably mounted to said housing, a first valve member attached at one end of the valve stem for closing said first port when said valve means is in said closed position, and a second valve member attached at the other end of said valve stem for closing said second port when said valve means is in said closed position,

means for resiliently urging said valve means towards its closed position,

means for moving said valve means to its open position, and

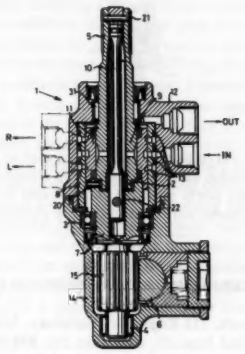
means responsive to a fluid flow rate through said second fluid passage means greater than a predetermined amount for retaining said valve means in said open position.

4,535,798

ROTATION CONTROL VALVE OF POWER STEERING SYSTEM

Osamu Sano, Kashihara, Japan, assignor to Koyo Auto-Mech. Co., Ltd., Kashihara, Japan

Filed Sep. 21, 1982, Ser. No. 420,635
Claims priority, application Japan, Sep. 22, 1981, 56-148807
Int. Cl.³ B62D *5/08*
U.S. Cl. 137—625.21 **2 Claims**



1. A rotation control valve for a power steering system, said rotation control valve comprising:

an input shaft;

a spool section of the input shaft;

an output shaft;

a valve housing;

a chamber defined by the valve housing;

a valve body mounted within the chamber of the valve housing, said valve body surrounding the spool section and being secured to the output shaft;

a torsion bar interconnecting the input shaft and the output shaft for controlling supply and discharge of pressure fluid to and from a hydraulic pressure cylinder acting on said output shaft in accordance with angular displacement of the spool section and the valve body commensurate with a load applied to the output shaft;

a seal housing floatingly mounted within the chamber of the valve housing between said valve housing and said valve body, said seal housing surrounding the valve body, the valve body being rotatably mounted within the seal housing and a clearance in the range of 0.005 to 0.02 mm exists between the seal housing and the valve body; and

O-rings supporting the seal housing within the chamber of the valve housing, said seal housing thereby being movable in a radial direction within the valve housing.

4,535,799

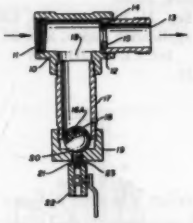
AUTOMATIC LIQUID SHUT-OFF VALVE

Robert E. Boley, 1802 Tremont, Massillon, Ohio 44646

Filed Oct. 29, 1984, Ser. No. 666,157
Int. Cl.³ F16K *31/22*
U.S. Cl. 137—174 **6 Claims**

1. A device for interposition in a gas line, said device comprising a hollow body member having oppositely disposed horizontally aligned inlet and outlet ports and a liquid receiving chamber depending therefrom and in communication therewith, a vertically positioned valve seat positioned in the device in said outlet port and a horizontally positioned valve seat positioned in said device in the lower portion of said liquid receiving chamber, a drain opening in said liquid receiving chamber below said horizontally positioned valve seat, a floatable spherical valve element movably positioned in said liquid receiving chamber for movement from a first position on said

horizontal valve seat controlling said drain opening to a second position adjacent said vertically positioned valve seat by fluid received in said liquid receiving chamber from said gas line,



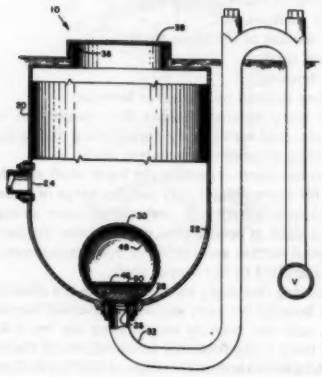
said spherical valve element being of a size to move partially into the area within said liquid receiving chamber between said inlet and outlet ports so as to be movable by said gas into seating engagement with said vertically positioned valve seat.

4,535,800

VALVE SYSTEM FOR VACUUM SEWAGE COLLECTION SYSTEM

Edward H. Leech, 721 Edgar Dr., Salisbury, Md. 21801

Filed Mar. 27, 1984, Ser. No. 594,038
Int. Cl.³ E03F *1/00*; F16K *31/18, 33/00*
U.S. Cl. 137—205 **1 Claim**



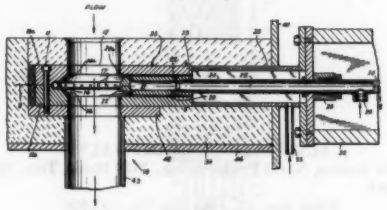
1. In a vacuum-type sewage collection system having a holding tank with top and bottom and at least one intake port, a discharge port and discharge line connected with a vacuum main, and means for controlling discharge of sewage through said discharge port, the improvement comprising: the discharge port being at the bottom of the holding tank, the means for controlling comprising a float with a part thereof proportioned for fitting against said discharge port, said float porportion including a generally rounded lower portion, means for orienting said float, said orienting means being permanent ballast in said float generally rounded lower portion; means for adjusting buoyancy of said float, including means for holding liquid within said float; said generally rounded lower portion being part of a spherical overall shape of the float, means for causing the float to center gravitationally on the discharge port including the holding tank bottom having a generally rounded shape; the generally rounded shape of the holding tank bottom being faired into the overall shape of the holding tank, means for preserving sewage portage in said discharge line comprising a plurality of leakage-producing contours at said part of the float proportioned for fitting against said discharge port, said holding tank having an access port therein above the discharge port, and a cover for said access port, and the access port being large enough for removal of the float therethrough.

4,535,801

MULTI-PURGE GATE VALVE FOR PARTICULATE SOLIDS FLOW

Thomas J. Neale, Parsippany, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Apr. 7, 1983, Ser. No. 482,809
Int. Cl.³ B08B *3/04, 9/00*
U.S. Cl. 137—240 **15 Claims**



1. A gate valve assembly for controlling the flow of fine particulate solids therethrough, comprising:

(a) an elongated valve body having a transverse opening therethrough near one end and packing means provided at the opposite end, said body containing a centrally-located groove located transverse to said opening and having dual adjacent inner seating surfaces;

(b) a conduit retained in said groove in the valve body, said conduit having a plurality of spaced openings oriented radially inwardly and arranged for inward flow of a pressurized purging gas through the openings to purge the gate valve assembly seating surfaces;

(c) a gate member longitudinally movable within said body, said gate being aligned within said groove and mating with said seating surfaces, said conduit surrounding said seating surfaces and said gate member for purging said seating surfaces, and

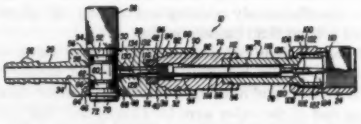
(d) a valve stem rigidly connected to said gate member and extending through said packing means, for moving the gate longitudinally within said body to open and close said transverse opening in the valve body.

4,535,802

TWIST-CAM REFRIGERANT DISPENSING VALVE

James D. Robertson, 231 NW. 69 Way, Hollywood, Fla. 33024

Filed Jan. 26, 1984, Ser. No. 574,309
Int. Cl.³ F25B *45/00*
U.S. Cl. 137—322 **9 Claims**



1. In a system for charging refrigeration apparatus with refrigerant gas from a portable pressurized source of said gas, the refrigeration apparatus having an inlet port for receiving gas and the source having an outlet port through which gas is discharged, the improvement comprising a valve apparatus capable of connection between the inlet port of the refrigeration apparatus and the outlet port of the gas source, comprising:

means connectible to the valve apparatus for detachably

joining a first portion of the valve apparatus to the outlet port of the gas source;

means carried by the valve apparatus for detachably joining a second portion of the valve apparatus to the inlet port of the refrigeration apparatus, a longitudinal channel extending through the valve apparatus to communicate said first and second portions with each other and with ambient and through which fluid is capable of flowing;

valve means carried within the channel for closing the channel to fluid flow when in an unbiased configuration and for allowing fluid flow through the channel when biased to an open position;

manually manipulable means carried by the valve apparatus for biasing the valve means to an open position to allow fluid flow through the valve apparatus, the manually manipulable means including an eccentric cam rotatable internally of the valve apparatus to bias the valve means to an open position, and further including a rotary thumb turn extending externally of the valve apparatus and being connected to the cam such that the cam is rotated to bias the valve means into an open position on rotary manipulation of the thumb turn;

first needle element disposed adjacent to the valve means and biasable outwardly thereof toward the second portion of the valve apparatus to engage and open for fluid transport valving structure associated with the inlet port of the refrigeration apparatus; and,

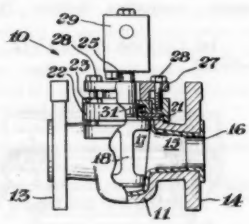
the valve means comprising a valve element having an internal spring, a first pin biased outwardly of the valve element by the spring, a second pin biased inwardly of the valve element by the spring, a second needle element disposed adjacent to the valve means on the opposite end thereof, the second needle element being biased against the first pin by the cam of the manually manipulable means on rotation of the thumb turn to a position biasing the first pin inwardly of the valve element against pressure exerted by the spring, thereby to open the valve element to fluid flow through the valve apparatus and the second needle element being in constant contact with the first pin and the cam in all positions of the cam.

4,535,803

PLUG VALVE

Robert W. Price, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 19, 1984, Ser. No. 590,947
Int. Cl.³ F16K *27/00*
U.S. Cl. 137—375 **6 Claims**



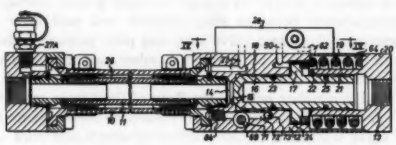
1. A plug valve, the plug valve comprising in cooperative combination a valve body, the body having a first end and a second end, a fluid passageway extending from the first end to the second end, a plug receiving cavity defined by the body with the plug receiving cavity extending generally normally to the axis of the fluid passageway extending from the first end to the second end; a plug disposed within the passageway, the plug having a stem, the stem extending away from said valve body, the valve body and the plug having a synthetic resinous coating thereon, a generally planar seal member disposed over said plug adjacent the stem, a bonnet disposed over said seal member, said bonnet being affixed to the valve body and forcing said sealing member in sealing engagement with the valve body, said bonnet defining a generally centrally disposed stem receiving passageway of a diameter substantially greater than the diameter of the stem; a gland adjustably positionable on said bonnet and extending into the passageway of the bonnet about the stem, the improvement which comprises said plug at a location adjacent the juncture of the plug and the stem defining an annular frustoconical surface having its major diameter adjacent said plug and its minor diameter adjacent said stem; said seal member defining a generally centrally disposed opening therein of sufficient diameter to pass over said stem, the opening being defined by a flexible annular seal portion which when the seal is positioned against the plug, the flexible annular seal portion conforms to the annular frustoconical surface, a retaining ring having an inside diameter approximating the major diameter of the frustoconical surface; a cup seal of annular configuration having a trapezoidal cross section disposed against the sealing member and having a face generally parallel to the frustoconical surface, the cup seal being restrained from radial movement by said annular retaining ring, said cup seal being of a pressure deformable synthetic resinous material, a rigid annular cup seal support ring disposed adjacent said cup seal and remote from said plug; means to resiliently tension the cup seal support ring toward said plug to thereby provide a plug valve with a reduced tendency to leak and desirable service life.

4,535,804

CONDUIT-BREAK VALVE FOR A PRESSURE CONDUIT OR HOSE WITH A SURROUNDING PROTECTIVE CONDUIT OR HOSE

Karl S. Palmgren, Luleå, Sweden, assignor to Regioninvest I Norr AB, Luleå, Sweden

PCT No. PCT/SE83/00020, § 371 Date Sep. 15, 1983, § 102(e) Date Sep. 15, 1983, PCT Pub. No. WO83/02988, PCT Pub. Date Sep. 1, 1983
PCT Filed Jan. 25, 1983, Ser. No. 537,410
Claims priority, application Sweden, Feb. 25, 1982, 8201177
Int. Cl.³ F16K *17/24*; F17D *5/04*
U.S. Cl. 137—458 **5 Claims**



1. A conduit-break valve for a pressure conduit or hose (11) with a surrounding protective conduit or hose (10) and with a space (26) for containing pressure medium between said conduits or hoses, comprising in its valve housing (12) a throughflow passage (13, 14) and a main valve member (16) which is movable between an open position and a closed position preventing flow through the throughflow passage (13, 14) and is adapted to be actuated by the pressure medium in said space (26) to be kept in the open position against the action of a loading device (19) which is adapted yieldingly to urge the main valve member (16) towards the closed position and, if the pressure of the pressure medium in said space (26) drops, to move the main valve member (16) to its closed position, and a pressure relief device (28) which is connected to said space (26) and adapted to relieve the pressure therein if the pressure exceeds a predetermined upper limit value, characterised in that the pressure relief device (28) has a pilot controlled check valve (41, 42) with a control piston (37) which is adapted to be actuated by the pressure in said space (26) and, when the upper limit value is exceeded, to open the check valve member (42) of the check valve (41, 42) which is yieldingly loaded in accor-

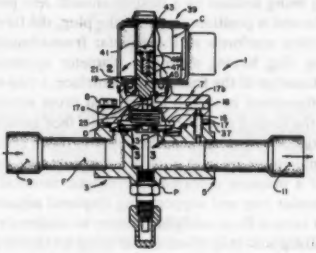
dance with said limit value, thus relieving the pressure in said space (26).

4,535,805

PILOT OPERATED VALVE WITH PRESSURE RELIEF

Denny W. Mertz, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 21, 1983, Ser. No. 487,848
Int. Cl.[3] F16K 31/12
U.S. Cl. 137—489 7 Claims



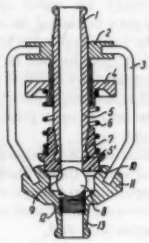
1. In a pilot-operated valve comprising a valve body having a flow path therethrough, the latter having an inlet and an outlet, said valve body having a valve seat within said flow path and main valve means sealably mounted within said valve body for movement between an open position in which said main valve means is clear of said valve seat thereby to permit the flow of fluid through said flow path and a closed position in which said main valve means sealably engages said valve seat thereby to block the flow of fluid through said flow path, said valve body further having a chamber therewithin in which said main valve means is received as it moves between its closed and open positions, a fluid supply passage for communication between said flow path upstream from said valve seat and said chamber for supplying pressurized fluid to said chamber, fluid pressure within said chamber acting to hold said main valve means in one of its stated positions, a pilot passage for communication between said chamber and said flow path downstream from said valve seat, said pilot passage including a pilot valve seat, a pilot valve member movable relative to said pilot valve seat between an open position in which said pilot valve member permits the flow of fluid from said chamber via said pilot passage to said flow path downstream from said valve seat and a closed position in which said pilot valve member is in sealing engagement with said pilot valve seat thereby to blook the flow of fluid from said chamber, a spring for biasing said pilot valve member toward its closed position, and selectively actuable means for effecting movement of said pilot valve between its said one and the other of its said positions so that with said pilot valve open, fluid pressure within said chamber being less than the fluid pressure within said flow path whereby the fluid pressure within the flow path maintains said valve means in its said one position and so with the pilot valve member closed fluid pressure within said chamber increases so as to positively hold the valve means in its said other position, wherein the improvement comprises: said pilot passage having a first portion between said chamber and said pilot valve seat and a second portion between said pilot valve seat and said flow path downstream from said valve seat, said pilot valve member having an area of sufficient size exposed to fluid pressure within said first portion of said pilot passage when said pilot valve member is in its closed position so as to overcome the bias of said spring forcing said pilot valve member toward its closed position upon the pressure differential of said fluid between said chamber and said flow passage downstream from said valve seat exceeding a predetermined level thereby to cause said pilot valve member to open which in turn effects movement of said main valve means from its said one to its said other position.

4,535,806

VALVE ASSEMBLY FOR THE SUPPLY OF A PRESSURIZED GASEOUS FLUID TO CLOSED CONTAINERS

Kaj Ottung, No. 8 Askebyvej, 2830 Virum, Denmark

Filed Dec. 6, 1983, Ser. No. 558,450
Claims priority, application Denmark, Dec. 21, 1982, 5646/82
Int. Cl.[3] F16K 17/26
U.S. Cl. 137—493.6 9 Claims



1. A pressure valve assembly for the supply of a pressurized gaseous fluid to a closed container, comprising:

a valve housing with a valve seat therein;

a tubular member guided for axial displacement towards and away from said valve seat and forming a fluid supply channel;

a resilient hollow pressure valve member releasably secured to said tubular member by a bulb connection at one end of the tubular member, the resilient valve member forming itself a seat for a non-return check valve; and

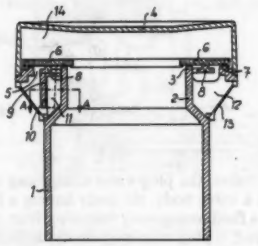
a spring urging said tubular member with the resilient pressure valve member thereon towards the valve seat in said housing.

4,535,807

AUTOMATIC AIR VALVE DEVICE FOR DUCTS

Kurt S. B. Ericson, Prins Boudewijnlaan, 48, B-2230 Schilde, Belgium

Filed Nov. 21, 1983, Ser. No. 553,762
Claims priority, application Belgium, Nov. 19, 1982, 0/209.518
Int. Cl.[3] F16K 15/08, 17/12
U.S. Cl. 137—533.31 5 Claims



1. In an automatic air valve device for a conduit used for passing fluids and capable of being subjected to a partial vacuum, said device being of the type comprising a tubular body, a cover cooperating with the tubular body to form a channel or peripheral air inlet therebetween, an annular flap cooperating with the valve body and said cover and disposed above said

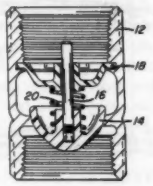
channel or peripheral air inlet so as to close the same, and a chamber formed in the space above said annular flap and defined by the inner periphery of said cover so that, when a partial vacuum occurs in the conduit, said annular flap is raised by ambient air upwardly into the chamber, the improvement which comprises said annular flap provided with an annular support having guiding lugs oriented downardly and the tubular body having integrally formed ribs disposed on the outer periphery thereof, said guiding lugs being provided with a U-shaped internal groove which cooperates with said integrally formed ribs.

4,535,808

CHECK VALVE

Leonard T. Johanson, Algonquin, Ill., and Harry L. Forrester, Wheeling, W. Va., assignors to Dicken Manufacturing Company, Siloam Springs, Ark.

Filed Jul. 8, 1983, Ser. No. 511,807
Int. Cl.³ F16K *15/06*
U.S. Cl. 137—543 **8 Claims**



1. A check valve adaptable to threaded pipe comprising:
a generally tubular body having a longitudinal axis, an inlet section, an outlet section, an intermediate interior section, an annular valve seat disposed between said intermediate section and said inlet section, said valve seat being angled with respect to said longitudinal axis, and a circumferential groove disposed between said intermediate section and said outlet section, said groove being of larger outside diameter than the interior diameter of said outlet section;
a flexible guide fabricated of an acetal copolymer and having a hub defining a longitudinal aperture having a square cross section and a plurality of arms extending outwardly therefrom, one of said arms having a first generally radially extending portion coupled to a second circumferentially extending portion having arcuate outer edges;
a poppet fabricated of an acetal copolymer and having a smoothly curved face and movable within said body between a first position whereat said poppet is seated upon said valve seat and a second position whereat said poppet is lifted from said valve seat;
a metallic stem secured to said poppet opposite said face and disposed for sliding motion within said aperture, said stem having a circular cross section; and
means reacting against said guide and said poppet for biasing said poppet toward said first position.

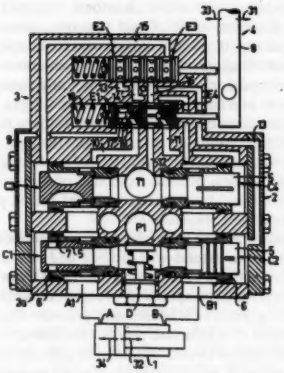
4,535,809

HYDRAULIC VALVE MEANS

Bo Andersson, 11 Venusvägen, Ljungsbro, S-590 60, Sweden

PCT No. PCT/SE82/00299, § 371 Date May 27, 1983, § 102(e) Date May 27, 1983, PCT Pub. No. WO83/01095, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 27, 1982, Ser. No. 503,131
Claims priority, application Sweden, Sep. 28, 1981, 8105719
Int. Cl.³ F17D *1/20*
U.S. Cl. 137—596.14 **13 Claims**

1. A hydraulic system for controlling a hydraulic motor as to speed as well as to direction of movement, said motor having motor ports serving alternatingly as an inlet for receiving a medium and as an outlet for returning the medium, said hydraulic system comprising:
a tank for containing a supply of the medium;
a main supply flow passage for delivering the medium to said inlet port;
a return flow passage for returning medium from said outlet port to said tank;
a pump connected to said tank for delivering pressurized medium to said main supply flow passage; and
a plurality of valve means for controllably opening and closing said main supply flow passage and said return flow passage to control the movement direction of the motor, said plurality of valve means including:
an inlet seat valve for each motor port located in said main supply flow passage between said pump and said motor port and an outlet seat valve for each motor port located in said return flow passage between said motor port and said tank, wherein said inlet and outlet seat valves each comprise a housing and a valve body movable within said housing from a closed position to an opened position and being pilot operable independent of the pressure by a pilot flow through a variable flow restriction channel in each valve body for conveying said pressure medium to a pilot flow chamber in the housing of each seat valve to any position between said closed and said opened positions to control the amount



of the pressure medium flowing through the main supply flow passage to the inlet motor port and of the pressure medium flowing through the return flow passage to the tank, respectively, and a pilot valve for each one of the inlet and outlet seat valves to obtain and control said pilot flow through said seat valves, wherein each pilot valve associated with the inlet seat valve for controlling the position of the valve body thereof independent of the pressure in the main supply flow passage comprising a housing having a pilot valve channel with a pilot inlet and a pilot outlet, means for selectively opening and closing said pilot valve channel, a first inlet pilot valve passage communicating said pilot inlet with said pilot chamber of the inlet seat valve and a first outlet pilot valve passage communicating said pilot outlet with said main supply flow passage at a location downstream of said inlet seat valve, and wherein each pilot valve associated with said outlet seat valve for controlling the position of the valve body thereof independent of the pressure in the return flow passage comprising a housing having a pilot valve channel with a pilot inlet and a pilot outlet, means for selectively opening and closing said pilot valve channel, a second inlet pilot valve passage communicating said pilot inlet with said pilot flow chamber of the outlet seat valve and a second outlet pilot flow passage communicating said

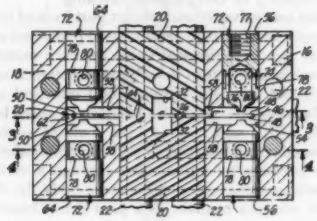
pilot outlet with said return flow passage at a location downstream of said outlet seat valve.

4,535,810

ELECTRICALLY CONTROLLED VALVES

Richard A. Duder, Campbell, and Allan B. Corral, San Jose, both of Calif., assignors to Dynamic Valves, Inc., Palo Alto, Calif.

Filed Mar. 27, 1984, Ser. No. 593,944
Int. Cl.³ F15B *13/044*
U.S. Cl. 137—596.17 **9 Claims**



1. A valve, said valve having a body formed so as to include separate pressure and return chambers, separate first and second load passages, each of said passages extending between and terminating in an opening in each of said chambers, a pressure port leading into said pressure chamber, a return port leading from said return chamber, first and second load ports connected to said first and second load passages, respectively, actuator means extending into said chambers for controlling the flow of fluid from said pressure port through said openings in said pressure chamber into each of said load passages for controlling the flow of fluid from said openings in said return chamber from said load passages to said return port in which the improvement comprises:

said actuator means comprising a member mounted on said body so as to extend into each of said chambers in such a manner that said chambers are isolated from one another,

said member being capable of being electrically actuated so that the portion of it within said pressure chamber and the portion of it within said return chamber are concurrently moved relative to said openings in said chambers upon the application of an electric signal so as to permit increased flow to either one of said passages from said pressure chamber and concurrently to restrict the flow from such passage into said return chamber while concurrently restricting the flow into the other of said flow passages from said pressure chamber and increasing the flow from such other passages into said return chamber,

said member is an elongated member held at its center by said body so that equal amounts of said member located at the ends of said member extend into each of said chambers,

said actuator means is a piezoelectric bender strip mounted on said body so that one end of said strip extends into one of said chambers and the other end of said strip extends into the other of said chambers, said body engaging said strip so as to isolate said chambers from one another.

4,535,811

AIR FLOW CONTROL APPARATUS

Joseph A. Wood, Greenville, and William C. Peebles, Jr., Washington, both of N.C., assignors to Flanders Filters, Inc., Washington, N.C.

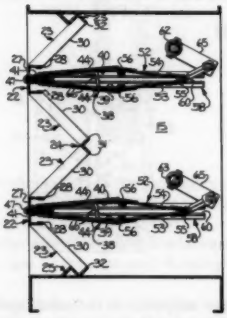
Filed Jan. 20, 1984, Ser. No. 572,696
Int. Cl.³ F16K *1/20*; F24F *13/10*
U.S. Cl. 137—601 **13 Claims**

11. An air flow control apparatus for regulating the volume of air flow in a ventilating system or the like, and comprising

a housing defining an air passageway therethrough,

supporting framework means mounted within said housing and including at least one trough of generally V-shaped cross section extending transversely across said housing, with said at least one trough including two opposite sides and an intermediate bight portion, and with each side having an opening which occupies a substantial portion of the area of such side,

closure means operatively associated with said at least one trough for selectively opening and closing each of the openings in the associated sides thereof, said closure means including a pair of plates, a plate pin pivotally interconnecting said plates, and means mounting said plate pin to said housing along an axis which extends along the trough and adjacent the bight thereof and so that the plates are pivotable between a spread-apart position overlying and covering the adjacent openings and a collapsed



position withdrawn from said openings, said mounting means including adjustable interconnection means for permitting adjustable movement of said plate pin along a direction which bisects the associated V-shaped trough in cross section and for fixing said pin in a selected position along such line, and such that a uniform pressure may be achieved between each of the plates and the sides of the troughs about the entire periphery of each opening,

resilient pad means surrounding the periphery of each opening and mounted to one of either said trough sides or said plates, and

control means for effecting selective movement of said closure means between said spread apart and said collapsed positions, to permit full closing or full opening of the openings as well as modulation of the air flow rate, and such that movement of said closure means to said spread apart position causes compression of said resilient pad means to effect an air tight seal about each opening.

4,535,812

TIME CONTROLLED GAS FLOWS

Elwood O. Miller, South Plainfield, N.J., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Jul. 12, 1982, Ser. No. 397,653
Int. Cl.³ F15B *21/02*
U.S. Cl. 137—624.11 **4 Claims**

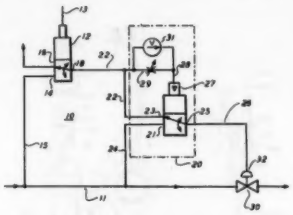
1. Apparatus for supplying a flow of gas under pressure through a conduit comprising

first valve means disposed in said conduit and having a control port with said first valve means being closed and opened in response to the presence and absence of gas pressure at said control port, respectively;

a pneumatic timed valve adapted to selectively supply said gas pressure to, and for a predetermined time period, remove said pressure from said control port, said pneumatic timed valve having first and second inputs, a pilot stage and timer means for releasing pressure in said pilot

stage over said predetermined time period, said second input being connected to said conduit; and

a solenoid valve having an output connected to said first input of said pneumatic timed valve, a first port coupled to ambient pressure and a second port connected to said conduit and normally coupled to said output such that the pilot stage of the pneumatic timed valve is connected



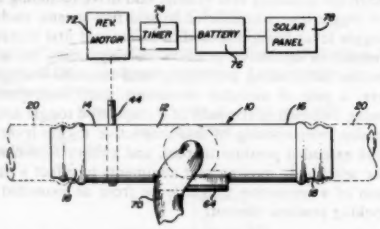
through said pneumatic timed valve to said control port of said first valve means whereby (i) the gas pressure in said conduit is supplied to said control port to retain the first valve means in a closed condition and (ii) upon activation of said solenoid valve, said pneumatic timed valve is operated to remove said gas pressure from said control port of said first valve means for said predetermined time period.

4,535,813

SOLAR ENERGY OPERATED IRRIGATION SURGE VALVE

Robin L. Spain, Drawer U, Olton, Tex. 79064

Filed Oct. 19, 1984, Ser. No. 662,510
Int. Cl.³ F16K *11/00*
U.S. Cl. 137—625.5 **8 Claims**



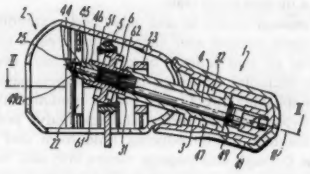
1. An irrigation surge valve including a hollow tubular body defining opposing axially spaced annular outlet seats, said body including an inlet opening into said body intermediate said seats, an elongated support mounted in said body for guided recilinear movement between first and second predetermined positions, a valve disc slidably mounted on said support for shifting therealong between relatively axially displaced limit positions, means operatively connected between said disc and support yieldingly biasing said disc toward an intermediate position on said support between said limit positions, said disc being alternately sealingly engageable with said seats upon alternate shifting of said support between said predetermined positions, reversible motor means operatively connected to said support for shifting said support between said first and second predetermined positions, said body including upper and lower sides and said lower side defining an internal upwardly opening sump communicated with the interior of said body between said seats and disposed below the path of movement of said disc between aid seats, said body further including a third outlet of smaller cross-sectional area than the effective flow cross-sectional area of said outlet seats, said third outlet opening into said body intermediate said seats and generally opposite from said inlet opening, said third outlet being disposed above the level of said sump.

4,535,814

LEVER HEAD FOR SINGLE-LEVER MIXING VALVES

Manfred Pawelzik, Soest; William P. Herring, Hemer, and Jan R. Kostorz, Menden, all of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrick GmbH & Co., Hemer, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,026
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230815
Int. Cl.³ F16K *11/02, 31/54*
U.S. Cl. 137—625.17 **18 Claims**



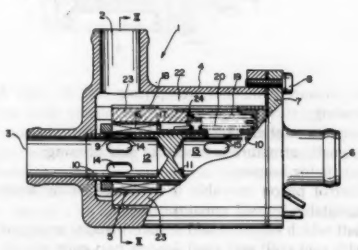
1. In a lever head for a single-lever mixing valve for sanitary use for regulating the mixing and volume flowing of cold and hot water with a hand lever which is pivoted substantially at right angles to a valve slide, the improvement wherein said valve slide is mounted for axial displacement and swinging movement transverse to said axial displacement in a plane thereof, and the control settings for adjusting the mixing ratio of cold and hot water are produced by turning the hand lever about its longitudinal axis to effect said swinging movement independently of said axial displacement and the control settings for adjusting the volume flow are produced by swivelling the lever about a pivot on the body to effect said axial displacement independently of said swinging movement.

4,535,815

ELECTROMAGNETIC SOLENOID TYPE FLOW CONTROL VALVE

Takeharu Ohumi; Yasuo Kurahashi, both of Toyota; Kyo Hattori, and Kazuhiro Sakurai, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Continuation of Ser. No. 156,162, Jun. 3, 1980, abandoned. This application May 14, 1984, Ser. No. 608,936
Int. Cl.³ F16K *11/07, 31/08*
U.S. Cl. 137—625.48 **2 Claims**



1. An electromagnetic solenoid valve comprising:

a valve body having inlet port means and outlet port means;

linear motor means including hollow core means disposed in said valve body between said inlet and outlet port means and having a plurality of valve ports, sliding valve member means slidable along said hollow core means for cooperating with said valve ports in said hollow core means, including spring means and flange means for supporting said spring means, and solenoid means associated with said

sliding valve member means for slidably moving the sliding valve member means along the hollow core member against the bias of said spring means when the solenoid means is energized;

said linear motor means including a yoke member fixed within said valve body, and a pair of magnets fixed to said yoke member at spaced apart locations, each said magnet including an outer surface, an inner surface, and a pair of ends, said flange means including surfaces abutting each said magnet on one end thereof for avoiding exposure of said abutting surfaces of said flange means to dynamic pressure from said flowing fluid when said solenoid means is in a de-energized state;

bypass passage means in said valve body extending radially outwardly around said linear motor means, and linearly parallel to said hollow core means, said linear motor means including openings into said bypass passage means for establishing direct radial fluid communication between said bypass passage means and said valve ports around said magnets for introducing fluid from said inlet port means through said passage means into said valve ports, said valve ports being controlled by said sliding valve member means

said outlet port means comprising two outlet ports communicating with said inlet port means through said bypass passage means and the valve ports in said hollow core means, said valve ports being linearly spaced away from each other along said core means for substantial alignment with respective outlet ports.

4,535,816

PRESSURE CONTROLLER

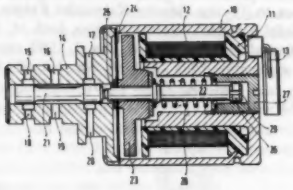
Meinrad Feder, Leonberg, and Alwain Stegmaier, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,978

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227229

Int. Cl.³ F16K *31/06*

U.S. Cl. 137—625.65 **6 Claims**



1. A pressure controller, comprising

a housing;

a magnetic coil arranged in said housing;

a magnetic armature arranged in said housing;

a distributor housing;

a control piston movable in said distributor housing and actuatable by said armature;

a shaft which supports said armature and is arranged coaxial with said coil, said shaft having two ends which respectively face toward and away from said control piston and are axially and radially supported;

a bearing bush which is arranged to slidingly support said shaft at its end facing away from said control piston; and

a membrane spring which is arranged to hold said shaft at its end facing toward said control piston and has a periphery held in said first-mentioned housing, so that the ends of said shaft are supported differently with one end of said shaft supported by said bearing bush and the other end of said shaft supported by said membrane spring.

4,535,817

DRIVE FOR AN OSCILLATORY MECHANICAL SYSTEM

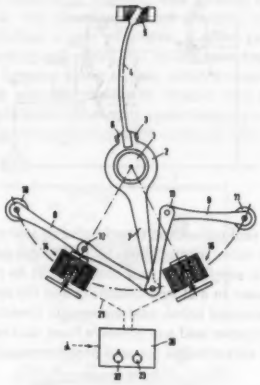
Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 20, 1984, Ser. No. 591,554

Claims priority, application Switzerland, Mar. 30, 1983, 1771/83

Int. Cl.³ F15B *13/044;* F16K *31/56*

U.S. Cl. 137—625.65 **8 Claims**



1. In combination

an oscillatory mechanical system having a first means for oscillating between two discrete operative positions and a resilient prestressing means for biasing said first means from one position to the other position; and

a drive for actuating said system, said drive including a pair of toggle levers connected to said first means, each said toggle lever being disposed to locate said first means in a respective operative position corresponding to an extended self-locking position of said respective toggle lever, a pair of movable abutments, each said abutment being disposed in the path of a respective toggle lever to inhibit overshooting of said respective toggle lever past said extended position thereof, and a control mechanism for selectively moving said abutments to effect a deflection of a respective toggle lever from an extended self-locking position thereof.

4,535,818

VALVE ASSEMBLY

Richard K. Duncan, and Norton A. Russell, both of Yellow Springs, Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Sep. 26, 1983, Ser. No. 536,108

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—846 **7 Claims**

1. Valve assembly for use within a flow path for permitting relatively free flow in said flow path in a first direction and for preventing flow in said path in a second, opposite direction, comprising:

a housing defining a housing interior having an interior surface and having first and second ports opening into said housing;

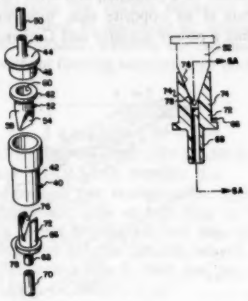
a flow regulator constructed as a single piece from a resilient material, said regulator including a pair of planar lips arranged in a converging relationship to define for said regulator an open end and a normally closed end whereat said lips are disposed adjacent each other to define a normally closed slit therebetween and to define inner and outer planar surfaces for said lips, said regulator further including at least one side wall interconnecting said lips;

means for securing said regulator within said housing interior with said normally closed end toward said second port and said open end toward said first port; and

means for forming a seal between said open end of said regulator and said housing interior so that flow in said first direction is from said first port, through said open end, through said normally closed end and to said second port;

said housing interior defining a shape such that said regulator is secured therein by said securing means with said outer surface of each of said lips being substantially adjacent to said housing interior surface when said normally closed end of said regulator is closed; and

said first and said second ports each having a cross-sectional area smaller than any cross-sectional area of said housing interior, said second port opening into said housing immediately adjacent said normally closed end of said regulator.



4,535,819

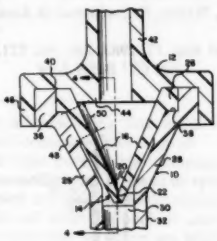
VALVE ASSEMBLY

Gordon E. Atkinson, Cedarville, and Stephen J. Kubina, Dayton, both of Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Jun. 4, 1984, Ser. No. 616,997

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—846 **7 Claims**



1. Valve assembly for use within a flow path for permitting relatively free flow in said flow path in a first direction and for preventing flow in said path in a second, opposite direction, comprising:

a flow regulator constructed as a single piece from a resilient material, said regulator including a pair of lips, each of said lips having a lip base and an outer end;

said lips being arranged in a converging relationship to define for said regulator an open end adjacent said lip bases, and a normally closed end at said lip outer ends whereat said lips are disposed adjacent each other to define a normally closed slit therebetween, said regulator further including at least one side wall interconnecting said lips and an annular flange extending outwardly at said open end;

a housing outlet portion defining a housing interior approximating the shape of said regulator, said housing interior having a pair of planar surfaces corresponding to said pair of lips, each of said planar surfaces having a planar surface base, said surfaces being arranged in a converging relationship from said planar surface bases toward an outlet end, said housing outlet portion further including an outlet port communicating with said outlet end and an annular collar disposed outwardly adjacent said planar surface bases; and

a housing inlet portion having a cover plate and an inlet port communicating therethrough;

said regulator being disposed within said housing outlet portion with said annular flange contained within said annular collar and said lip outer ends extending toward said outlet end of said housing interior, and with said lips being substantially adjacent to but not in contact with said planar surfaces;

said cover plate being attached to said annular collar for securing said regulator and for sealing said housing interior; and

each of said planar surfaces of said housing interior having a raised portion formed thereon adjacent said planar surface base and extending along at least a portion of said planar surface, each of said raised portions being formed of a height sufficient to cause said raised portion to contact the adjacent one of said lips.

4,535,820

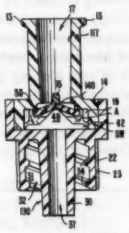
NORMALLY CLOSED CHECK VALVE

Kenneth C. Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed May 24, 1984, Ser. No. 613,644

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—854 **17 Claims**



1. A valve device comprising:

a first body element having an input opening therethrough;

a second body element which complements said first body element and having an outlet opening therefrom;

a resilient valve disc mountable between said first and second body elements;

first means with one body element for supporting the disc at the center thereof;

means with the other body element for holding said disc firmly against said first means in such a manner that said disc is restrained from sideways movement; and

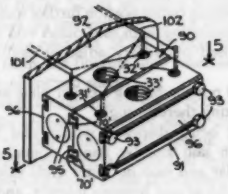
wherein said disc element is round, and both said first and second body elements have round container portions in which said disc element upon mounting is suitably spaced from the edges thereof, and wherein said means for preventing sideways movement of said disc element includes pressure between said two body element means for partially deforming the center area of said disc to restrain same against sideways movement.

4,535,821

THREE WAY VALVE

John Anderson, 2109 Yosemite Dr., Milpitas, Calif. 95035

Continuation of Ser. No. 379,734, May 19, 1982, abandoned.
This application Jul. 25, 1984, Ser. No. 634,282
Int. Cl.³ F16K *11/20*
U.S. Cl. 137—884 **5 Claims**



1. A valve comprising a plurality of valve bodies, each of said bodies being formed with a central cylindrical longitudinally-extending cavity, a flow-control spool disposed in each of said cavities for sliding reciprocating movement, each of said flow-control spools being formed with passages, means defining a material inlet passage in the wall of each of said bodies extending from the exterior thereof to its associated cavity, means defining a plurality of discharge passages in each of said bodies communicating with the associated cavity and spaced angularly about the axis of the associated cylindrical cavity from the associated inlet passage and spaced axially along its associated cavity on either side of the associated inlet passage, each of said bodies being formed with spaced apart locking grooves to form spaced apart joint grooves when said bodies are in juxtaposition, and spaced apart elongated locking I-shaped beams disposed in said joint grooves respectively in tight fitting relation for locking said bodies to one another when said bodies are disposed in juxtaposition, each of said joint grooves having an I-shaped cross-sectional area, each of said locking I-shaped beams being adapted to be inserted endwise into its associated joint groove as a sliding rail, each of said locking grooves being defined by projecting means in the wall of its associated body engageable with an abutment on the elongated locking I-shaped beam disposed therein for preventing movement of the associated body away from the beam disposed therein, each of said locking grooves being defined in its associated body by a recess, wherein each of said projecting means is formed with a flange overhanging its associated recess, and the abutment means on each of said beams including an upstanding wall disposed along one side of its associated recess.

4,535,822

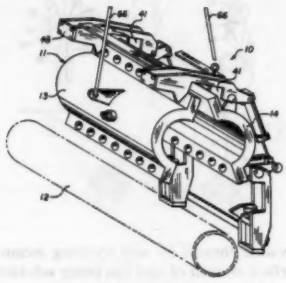
FITTING INSTALLATION DEVICE

Elmer V. Rogers, Jr., North Olmsted, Ohio, assignor to The Pipe Line Development Company, Cleveland, Ohio

Filed Jan. 21, 1983, Ser. No. 459,786
Int. Cl.³ F16Z *55/16*
U.S. Cl. 138—99 **18 Claims**

1. Apparatus for remotely installing a fluidtight split fitting on an intermediate location of a pipeline, the fitting being split longitudinally into mating segments and being provided with means for hinging the segments together in the manner of a clamshell, manipulator means mounted on the segments and being constructed and arranged to engage portions of the segments and forcibly close them together into fluidtight mating contact with one another, said manipulator means including C-shaped clamp means and power operated means for moving said clamp means relative to said segments, said clamp means including power-operated means, said clamp means being movable by said power operated means from a retracted position to an operational position, said clamp means in said retracted position allowing said segments, while hinged together, to pass onto the pipeline at said location and in said operational position being disposed adjacent a line at which the fitting is split and bridging a gap between the segments at such line, the poweroperated means being arranged to engage and maintain the segments closed in fluidtight relation against forces developed by pressure prevailing in the pipeline.

16. A method of assembling a fitting on the intermediate length of a pipeline including the steps of supplying a longitudinally split fitting of mating half segments, the segments being provided with means for hinging the segments together at one side in the manner of a clamshell and with radially extending flange elements at an opposite side, mounting manipulator means including a power actuator and C-clamp means on one



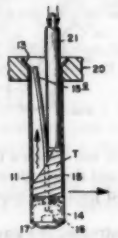
of the segments in a manner permitting such hinged segments to assume a pipeline clearance position wherein the segments can pass over the pipeline while hinged together and an operational position wherein the segments encircle the pipeline, using the power actuator of the manipulator means to move the C-clamp means from a retracted position permitting passage of said segments over the pipeline to an operational position wherein the C-clamp means extends generally transverse to the mating plane of said segments when they are closed over the pipeline such that it bridges said flange elements of both segments, and using means on said C-clamp means to squeeze said segments together through said flange elements.

4,535,823

METHOD OF FILLING CONTAINERS WITH A VISCOUS SUBSTANCE

Richard Powers, Wayne, Pa., assignor to Accupac, Inc., Mainland, Pa.

Filed Aug. 17, 1983, Ser. No. 521,105
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—5 **9 Claims**



1. A method of rapidly flowing a viscous substance into a container having at one end an actuating mechanism and a depending flexible central stem terminating adjacent an open opposite end of the container without forming substantial air pockets at said one end, said method comprising the steps of:

disposing the container with its open end facing upwardly,

advancing relative to the open end of the container the lower end of a filling tube,

engaging the filling tube laterally against the stem and displacing it toward a side of the container,

inserting the filling tube lengthwise in the container to a predetermined location,

at said location initiating the discharge of the viscous substance into the container laterally of the stem for displacing air laterally and axially out of the container, and

withdrawing the filling tube from the container while simultaneously discharging the viscous substance therefrom and thereby continuing to discharge air axially out the open end of the container, whereby the container can be filled rapidly without forming substantial air pockets adjacent to its one end.

4,535,824

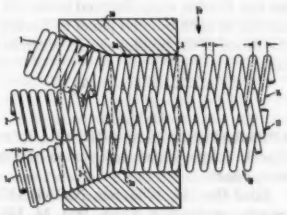
METHOD AND APPARATUS FOR THE MANUFACTURE OF WIRE LINK BANDS

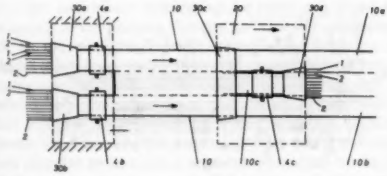
Heinz Kerber, Weidenthal, and Hella Kerber, Himberg 12, D-6731 Weidenthal/Pfalz, both of Fed. Rep. of Germany, assignors to Hella Kerber, Weidenthal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 260,698, May 5, 1981, abandoned. This application Jun. 3, 1983, Ser. No. 500,669

Int. Cl.³ B21F *15/02*

U.S. Cl. 140—111 **19 Claims**





1. A method for manufacturing link bands of wire-like monofilament material comprising the steps of:

providing a set of at least three helices comprising helically formed wire-like monofilaments of metal or synthetic material, wherein the pitch and diameter of the several helices are substantially equal and alternate ones of said helices are right-hand wound coils and the others are left-hand wound coils, the pitch of said helices being less than twice the diameter of the monofilaments of said helices,

simultaneously pulling the set of helices through a narrow closure slot adapted to align the helices and exert resistance to the pulling tension thereon, whereby to open the pitch of the coils elastically and to press adjacent turns of the aligned helices toward each other to cause each turn of each wire helix to become interdigitated between the adjacent two turns of the adjacent helices, and thereafter releasing the tension on said coils to permit the interdigitated coils to grip one another.

7. An apparatus for manufacturing wire-link bands from a set of at least three aligned, alternately right-hand and left-hand helices of metal or synthetic material and of substantially uniform diameter and each helix having a pitch of less than twice the diameter of the wire of the helices comprising

closure slot means having a closure slot which has a lateral entrance opening with one dimension equal approximately to the sum of the overall diameters of the individual helices, the closure slot narrowing down from the entrance opening to an exit opening smaller than the sum of the diameters of the set of helices, whereby said helices must interengage or interdigitate to pass out of said exit opening,

drive means adjacent the exit side of said closure slot means for moving the interengaged or interdigitated set of helices away from the exit of said slot and for applying sufficient tension to the helices to open the pitch of the helices and cause the adjacent helices to engage each other as the set of helices passes through said closure slot of the closure means.

4,535,825

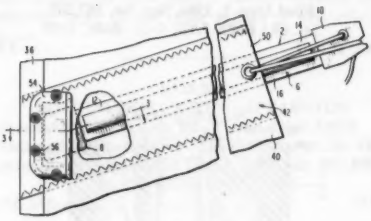
SAIL BATTEN IMPROVEMENTS

John Hackney, P.O. Box 1146, Jensen Beach, Fla. 33457

Filed Apr. 18, 1983, Ser. No. 486,216

Int. Cl.³ B63H *9/04*

U.S. Cl. 114—103 **13 Claims**



1. A batten for a full battened sail provided on its fore end with a luff cap that comprises:

a fore portion and an integral aft portion,

means on said aft portion to attach said luff cap to said batten,

said fore portion having a leading edge that for the majority of its length defines a straight line which forms a single acute angle with the longitudinal axis of said batten.

4,535,826

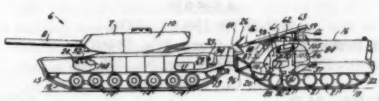
APPARATUS FOR RAPID REFUELING OF ARMORED FIGHTING VEHICLES

Edward D. Bell, 5846 Denny Ave., North Hollywood, Calif. 91601

Filed Aug. 29, 1983, Ser. No. 527,422

Int. Cl.³ B67D *5/00*

U.S. Cl. 141—231 **5 Claims**



1. Apparatus for remotely transferring fuel between armored and/or tracked ground vehicles comprising the combination of:

a mobile storage or tanker vehicle having a quantity of liquid fuel stored therein;

a mobile fuel consuming vehicle;

fuel dispensing means operably carried on said storage vehicle for conducting stored fuel therefrom which includes an elongated pivoting telescoping boom outwardly cantilivered from a selected end of said storage vehicle and terminating at its free end in a nozzle configured for operation without human contact;

a remotely operating cover enclosing said nozzle resiliently carried on said boom including a pair of doors having open and closed positions responsive to control means for exposing and covering said nozzle;

receptacle mean carried on said fuel consuming vehicle at a selected end thereof for insertably receiving said exposed nozzle for receiving fuel from said storage vehicle in a remote manner;

spacing means operably carried on said selected ends of said vehicle for abutting engagement to establish a predetermined spacing or distance between said vehicle selected ends; and

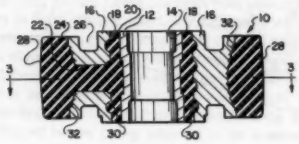
said predetermined spacing or distance related to said insertable reception penetration depth of said dispensing means within said receptacle means.

4,535,827

MOLDED SHOCK-ABSORBING WHEEL ASSEMBLY

F. Leo Seaford, Concord, N.C., assignor to Wil-Mat Corporation, Gastonia, N.C.

Filed Mar. 7, 1984, Ser. No. 587,302
Int. Cl.³ B60B 5/02, 9/12; B60C 7/08
U.S. Cl. 152—7 **4 Claims**



1. A shock-absorbing wheel assembly comprising:

(a) annular bearing means;

(b) an annular core member disposed concentrically about said bearing means with the interior surface of said core member spaced from the exterior surface of said bearing means, said annular core member having at least one passageway extending radially therethrough from the exterior surface thereof to said interior surface thereof; and

(c) a moldable plastic material disposed to cover said exterior surface of said core member with a predetermined thickness, to fill said radial passageway, and to fill said spacing between said core member and said bearing means, whereby said moldable plastic material constitutes the sole bond between said bearing member and said core, and forms a tread portion at the exterior surface of said core member.

4,535,828

WINDOW INSULATOR

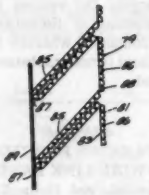
Peter B. Brockhaus, Rte. 1, Owen, Wis. 54460

Filed May 2, 1983, Ser. No. 490,466
Int. Cl.³ E06B 9/06
U.S. Cl. 160—84 R **6 Claims**

4. Apparatus for inhibiting heat transfer through a building opening pane comprising:

(a) sill means for vertical movement within the building opening;

(b) a shade fastened to the sill means and fabricated from a laminated insulating material including a layer of air bubbles encapsulated between a thin sheet of flexible material embossed with a multiplicity of indentations and a skin of thin flexible material bonded to the embossed thin sheet to encapsulate the bubbles within the indentations, the shade having a plurality of sets of first, second, and third panels, the first and second panels of each set being of substantially equal length with each other and being folded over into facing contact with each other and bonded along their facing surfaces to form a bonded panel having a free end and a hinged end, the third panel of each set being



interposed between and hinged to successive bonded panels, the bonded panels being sloped toward the building opening pane when in the operative condition to form a plurality of three-sided pockets of stagnant air between the pane and the third panels; and

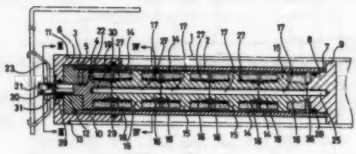
(c) at least one flexible strap fastened to the sill means and to the free end of each bonded panel to fixedly maintain the sloped attitude of the bonded panels when in the operative condition.

4,535,829

BRAKE APPARATUS FOR WINDING A ROLL-SCREEN

Shigeki Fukuchi, Tokyo, Japan, assignor to Metako Kigyo Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,187
Claims priority, application Japan, Dec. 24, 1982, 57-230334
Int. Cl.³ E06B 9/208
U.S. Cl. 160—291 **1 Claim**



1. A brake apparatus for winding a roll-screen which comprises a pipe for winding the roll-screen; a cylinder fixed coaxially within a pipe; a plurality of brake bodies in the form of a double-cylinder integrated at its intermediate part, an inner cylinder of which is tapered toward its end faces or its center, said brake bodies being arranged in series within the cylinder and being slidably rotatable on the inner circumference of the cylinder; a fixing brake body in the form of a double-cylinder having a diameter equal to the brake body and closed one end, or in the form of a single-cylinder of a shape lacking an outer cylinder of the double-cylinder, said fixing brake body being arranged in one end of the cylinder and having its open end abutted to the brake body, said fixing brake body being provided at its bottom center opposite to the open end with a fixing shaft having a top end extended from one end of the winding pipe; a viscous fluid optionally filled between the outer circumference of the brake body and the fixing brake body on one hand and the inner circumference of the cylinder on the other hand; and coil springs having an inner diameter slightly less than an outer diameter of the inner cylinder and wound in the winding direction of the roll-screen, said coil springs being fitted over the inner cylinders of the fixing brake

body and the adjacent brake body and over the inner cylinders of the adjacent brake bodies to form an one way spring clutch having a play or a torsional flexure in one way of the winding direction.

4,535,830

LATERAL-TRACTION ROLLER SHADE

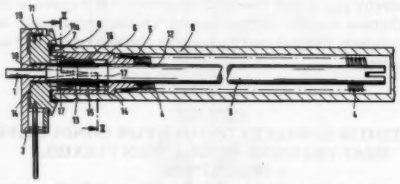
Hans Appel, Bremen, and Hermann Heidenescher, Melle, both of Fed. Rep. of Germany, assignors to Zundwarenfabrik Stracke GmbH & Co., Melle, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,019

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232722

Int. Cl.³ E06B *9/208*

U.S. Cl. 160—299 **8 Claims**



1. In a lateral-traction roller shade having a housing, a lateral sheave rotatably mounted in the housing, means effecting a driving relation between the sheave and a tubular roller-shade shaft and resiliently active means for retaining the shaft in position relative to the housing and which is releasable in response to the rotation of the sheave, the improvement comprising: a rod disposed in the interior of the shaft and fixed at one end to the housing; wherein the means effective a driving relation between the sheave and the shaft comprises a bushing mounted around the rod and within the shaft for rotation relative to the rod without any longitudinal displacement and fixed to the sheave and the shaft, the bushing including means forming an annular compartment around a portion of the rod; a retracting spring disposed around the rod and fixed at one end to the rod; means connecting the other end of the retraction spring to the bushing thereby functionally connecting the shaft to the retracting spring; wherein the retaining means includes a retaining spring disposed around the rod and in the annular compartment, means connecting the one end of the retaining spring furthest from the sheave to the bushing to effect rotation of the retaining spring with the bushing and wherein the other end projects outwardly and is movable in a given circular path, a drive segment connected to the sheave and disposed in the given path of the other end of the retaining spring and a drive member fixed on the bushing and in said given path downstream of the other end in the unwinding direction.

4,535,831

PATTERN FOR PRODUCING A MOLD AND METHOD FOR MANUFACTURE OF THE PATTERN

Kan-ichi Sato; Akio Yamanishi, and Takashi Higashino, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,273

Claims priority, application Japan, Mar. 17, 1981, 56-37215

Int. Cl.³ B22D *13/10*

U.S. Cl. 164—33 **2 Claims**

1. A method of producing a pattern for use in the manufacture of a mold, comprising the steps of:

(a) forming a rolled-over male pattern by using a wooden pattern;

(b) forming a rolled-over female pattern having a thin-walled scale-off layer along a boundary thereof with said rolled-over male pattern by using the latter;

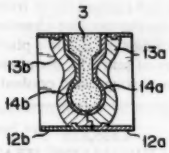
(c) removing the thin-walled scale-off layer from said rolled-over female pattern;

(d) pouring a silicone RTV rubber into a cavity of said rolled-over female pattern to form a match plate therein;

(e) setting a metallic frame on said match plate;

(f) filling the interior of the metallic frame with a mixture of microwave-pervious resin and silica sand;

(g) causing said mixture to be thermally cured thereby forming a reinforcing layer on the peripheral surface of said match plate;



(h) placing said rolled-over male pattern within said metallic-frame-supported reinforcing layer after removing said match plate therefrom; and

(i) injecting a microwave-pervious and heatproof material into the gap formed between said reinforcing layer and said rolled-over male pattern thereby forming a mold defining layer on the inner surface of said reinforcing layer.

4,535,832

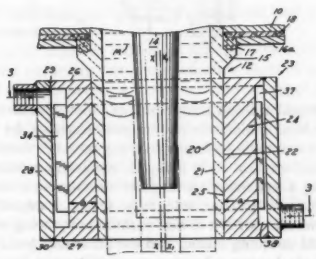
CONTINUOUS CASTING APPARATUS

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Continuation-in-part of Ser. No. 258,590, Apr. 29, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,276

Int. Cl.³ B22D *11/00, 11/04*

U.S. Cl. 164—421 **22 Claims**



1. In a continuous casting apparatus wherein molten metal flows through a die progressively and is solidified in the die and withdrawn from the die, a die and cooling assembly comprising

a tubular die having opposite inlet and outlet ends and an external tapered surface which is uniformly tapered radially inwardly towards the outlet end of the die,

a cooling sleeve having a longitudinal axis, and an internal surface complementary to the external surface of the die and in substantial intimate surface contact with the external surface of said die,

an annular cooling shell surrounding said cooling sleeve and having portions thereof spaced from said sleeve to define a cooling chamber,

at least one coolant inlet into the chamber for admitting coolant into the chamber,

at least one coolant outlet from said chamber for discharging coolant from the chamber,

said inlet and said outlet being spaced along the axis of the

sleeve with the outlet being nearest the inlet end of the die into which the molten metal flows,

means forming a first annular coolant chamber about the sleeve in the region of and in communication with said coolant inlet,

means forming a second annular coolant chamber in the region of and in communication with said coolant outlet,

said cooling sleeve having a body and a plurality of circumferentially spaced integral ribs extending longitudinally along the body and extending radially outwardly from the body in spaced relation to the inner surface of said cooling shell such that in use coolant flows from the coolant inlet about said first annular coolant chamber along the inner surface of the cooling shell and in a plurality of axial paths along the surfaces of said ribs, about said second annular chamber and then through said coolant outlet.

4,535,833

VERTICAL MULLION HAVING HEAT TRANSFER MEDIUM FLOW PASSAGE

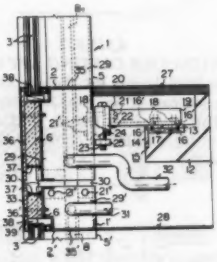
Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 10, 1983, Ser. No. 521,970

Claims priority, application Japan, Aug. 10, 1982, 57-121466[U]

Int. Cl.³ F24D *5/10*

U.S. Cl. 165—53 **3 Claims**



1. A vertical mullion comprising an outer structural member and a vertical mullion body coupled together by coupling means and embracing a heat insulating member therebetween, said vertical mullion body being an integrally extruded member having a generally rectangular cross-section and a heat transfer medum passage integrally set in a central portion thereof, one end portion of said mullion body being adapted to receive said coupling means, and the other end portion of said mullion body having a bracket means disposed for vertically slidable movement in a stationary fastener.

4,535,834

METHOD AND APPARATUS FOR CONTROLLING THERMAL TRANSFER IN A CYCLIC VACUUM PROCESSING SYSTEM

Norman L. Turner, Gloucester, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed May 2, 1984, Ser. No. 606,051

Int. Cl.³ F28F *9/00*

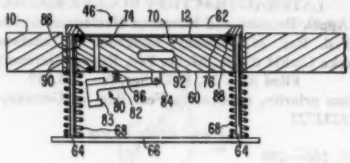
U.S. Cl. 165—80 R **9 Claims**

1. In a vacuum processing chamber which is vented during one portion of a processing cycle and is vacuum pumped to a low pressure during another portion of said cycle, apparatus for providing thermal transfer between a workpiece and a heat sink or source comprising:

a platen against which said workpiece is sealed to define a thermal transfer region therebetween, said platen including a passage for gas flow between said chamber and said thermal transfer region;

valve means for controllably opening and closing said passage; and

control means for closing said valve means when the pressure in said chamber reaches a predetermined intermediate pressure,



whereby gas at said intermediate pressure is trapped in said thermal transfer region during vacuum processing and conducts thermal energy between the workpiece and said platen.

4,535,835

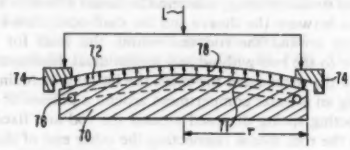
OPTIMUM SURFACE CONTOUR FOR CONDUCTIVE HEAT TRANSFER WITH A THIN FLEXIBLE WORKPIECE

Scott C. Holden, Manchester, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 381,668, May 25, 1982, abandoned. This application Jul. 18, 1984, Ser. No. 631,527

Int. Cl.³ F28F *9/00*

U.S. Cl. 165—80 R **10 Claims**



1. Apparatus for removal of heat from a planar article under irradiation by a radiation source, said apparatus comprising:

heat sink means for removal of heat transferred thereto from said article, said heat sink means including a nonplanar, nonspherical convex contact surface; and

clamping means for securing a peripheral portion of said planar article to said contact surface such that said article conforms to said contact surface, said contact surface having a contour which cooperates with said clamping means to impose uniformity of contact pressure over the surface area of said article in contact with said contact surface and to stress said article to approach the limiting elastic stress thereof.

4,535,836

VERTICALLY EXTENDING HEAT EXCHANGER

Edward B. Thomas, Verona, and Mark C. Peters, Pewaukee, both of Wis., assignors to Crepaco, Inc., Lake Mills, Wis.

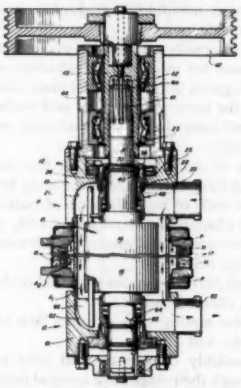
Filed Oct. 18, 1983, Ser. No. 543,080

Int. Cl.³ F28D *11/02*; F28F *5/02*

U.S. Cl. 165—86 **10 Claims**

1. A vertically extending heat exchanger comprising an upright chamber fixedly supported to assume a predetermined elevated position, said chamber having the interior thereof provided with a stationary inner sleeve of thermal conductive material, the exterior of said sleeve being encompassed by a heat exchange means; an elongated dasher mounted within said sleeve for selective relative longitudinal vertical movement

between operative and inoperative modes; when in an operative mode, said dasher being assembled within said sleeve and being adapted to be rotated about a central longitudinal axis of said sleeve and coacting with the latter to provide a product flow passage defined by an exterior portion of said dasher and an interior surface portion of said sleeve; an elevated first endwall assembly removably mounted on a lower exterior end portion of said chamber, said assembly being provided with dasher bearing means; a second endwall assembly elevated in relation to said first endwall assembly and mounted on an upper exterior end portion of said chamber, said second endwall assembly including a removable static seal section in encompassing non-rotating relation with an upwardly projecting axial segment of said dasher, and dynamic seal section in encompassing relation with said axial segment and rotatable



therewith as a unit, said static and dynamic seal sections having portions thereof in sealing engagement, both of said seal sections being movable endwise as a unit with the dasher relative to said second endwall assembly when said dasher is longitudinally moved between said operative and inoperative modes, unitary longitudinal movement of said seal sections and said dasher occurring without any manual adjustment of said second endwall assembly and while the latter remains mounted on the chamber upper exterior end portion; product inlet and outlet ports communicating with said product flow passage; and drive means elevated relative to said first endwall assembly and fixedly mounted adjacent the second endwall assembly and being provided with a drive segment operatively connected to the dasher axial segment for imparting rotational movement to said dasher when the latter is in said operative mode.

4,535,837

LATENT HEAT STORAGE DEVICE

Takahito Ishii, Yamatokoriyama; Kazuo Yamashita, Ikoma, and Hiroshi Uno, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

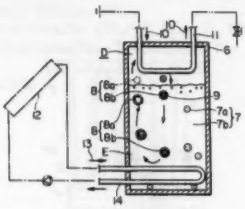
Filed Feb. 28, 1984, Ser. No. 584,393

Claims priority, application Japan, Mar. 2, 1983, 58-34967; Mar. 29, 1983, 58-54431; Mar. 29, 1983, 58-54432

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—104.17 **22 Claims**

1. A latent heat storage device comprising a closed vessel sealingly containing therein a latent heat storage material, a heat transfer medium substantially immiscibile with said latent heat storage material and changing from a liquid state to a gaseous state at the time of absorption of heat and from a gaseous state to a liquid state at the time of liberation of heat, and a heat output accelerating material having a density higher than at least the density of liquid phase of said latent heat storage material and being selectively wettable with said heat transfer medium more than with said latent heat storage mate-



rial, and a space portion being left in the uppermost area of the interior of the closed vessel.

4,535,838

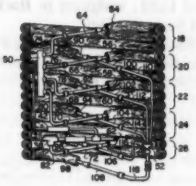
HEAT EXCHANGE COIL AND METHOD OF MAKING

David A. Gray, and Donald O. Webb, both of Tyler, Tex., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,013

Int. Cl.³ F28F *1/10, 9/26, 19/00*

U.S. Cl. 165—134 R **13 Claims**



1. A heat exchanger coil for a multiple circuit heat exchange unit comprising:

a plurality of adjacent individual fin and tube coil circuits disposed vertically one above another, each of said individual circuits having a lower end and an upper end, the upper end of an individual coil circuit juxtaposed the lower end of the individual coil circuit disposed immediately above to form a pair of adjacent circuit ends in said heat exchange coil and the axis of each of said upper and lower circuit ends being skewed downwardly and away from the portion of the individual coil circuit from which said ends extend so that moisture on the exterior of said circuit ends flows downwardly and away from said upper and lower circuit ends;

a first manifold;

a second manifold; and

means for connecting the upper end of each of said individual coil circuits to said first manifold and the lower end of each of said individual coil circuits to said second manifold, said connecting means intercrossed once for each of said pairs of adjacent upper and lower circuit ends said connecting means being fabricated from a metal dissimilar to the metal from which said coil circuits are fabricated.

4,535,839

HEAT EXCHANGER WITH CONVOLUTED AIR CENTER STRIP

Demetrio B. Sacca, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

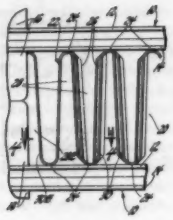
Filed Dec. 20, 1982, Ser. No. 450,963

Int. Cl.³ F28F *1/22, 3/06*

U.S. Cl. 165—153 **2 Claims**

1. In a heat exchanger having adjacent tube passes formed by plates with adjoining cup configurations at their ends wherein

a convoluted air center strip with rows of louvers across the width thereof is located between the plates of adjacent tube passes with its ends adjacent the cup configurations: an improved air center strip having at least one row of louvers at both ends of the strip closed so as to prevent air leakage through the ends of the strip around the adjoining cup configurations.

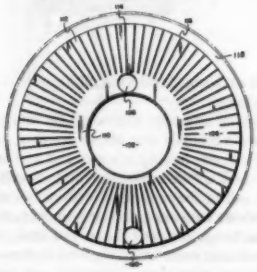


4,535,840

INTERNALLY MANIFOLDED UNIBODY PLATE FOR A PLATE/FIN-TYPE HEAT EXCHANGER

Irwin E. Rosman, Woodland Hills, and William R. Wagner, Los Angeles, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 80,877, Oct. 1, 1979, Pat. No. 4,347,896.
This application Apr. 30, 1982, Ser. No. 375,511
Int. Cl.³ F28F *3/08*
U.S. Cl. 165—167 **8 Claims**



1. An annular structure for a plate/fin-type heat exchanger, comprising:

at least one open-faced inlet plate wherein said plate comprises:

an inlet plate having an inner and an outer periphery, for channeling a fluid;

at least one side port adjacent to the outer periphery of said plate and transversely oriented through the top edge of said open-faced inlet plate;

one pair of integral external side manifolds for each side port, wherein one external side manifold is positioned at said side port and the second integral external side closed manifold is diagonally positioned on the opposite side wall;

means for internally manifolding, wherein said means are contiguous with said side port and adjacent to the outer periphery of said inlet plate;

a closed end coincidental with said outer periphery of said inlet plate;

a plurality of contact fins and channels for directing fluid flow and for enhancing heat transfer, and wherein each of said plurality of contact fins and channels are contiguous with, in the plane of, and radially extending from said means for internally manifolding;

an open end port contiguous with said contact fins and channels; and

a bottom for mating with an open face of a superposed outlet plate;

one open-faced outlet plate for each inlet plate, wherein said outlet plate comprises:

an outlet plate having an inner and an outer periphery for channeling a fluid;

at least one outlet plate side port adjacent to the inner periphery of said outlet plate and transversely oriented through the top edge of said open-faced outlet plate;

at least one pair of integral external side manifolds wherein one external side manifold is positioned at said outlet plate side port and the second integral external side closed manifold is diagonally positioned on the opposite side wall;

means for internally manifolding said outlet plate, wherein said means for internally manifolding said outlet plate are contiguous with said outlet plate side port and adjacent to the inner periphery of said outlet plate;

a closed end coincidental with said outer periphery of said outlet plate;

a plurality of outlet plate contact fins and channels for directing fluid flow and for enhancing heat transfer, and wherein each of said plurality of outlet plate contact fins and channels are contiguous with, in the plane of, and transverse to said means for internally manifolding said outlet plate;

an open end port contiguous with said outlet plate contact fins and channels; and

a bottom for mating with an open face of a superposed inlet plate; and

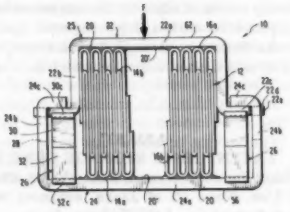
means for sealably connecting said inlet and said outlet plates through their respective integral external side manifolds so as to form said annular structure.

4,535,841

HIGH POWER CHIP COOLING DEVICE AND METHOD OF MANUFACTURING SAME

Paul Kok, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1983, Ser. No. 544,907
Int. Cl.³ H01L *23/36*
U.S. Cl. 165—185 **8 Claims**



6. A leaf-type cooling device for semiconductor chip packages manufactured in accordance with the method comprising the steps of:

removably laminating two strips of a heat transfer metal together back-to-back with a solvent soluble adhesive to form a composite strip;

coating the non-mating exposed planar surfaces of said composite strip with a solder;

folding said composite strip in accordion pleated fashion with compacted folds in abutment with one another and forming ridges at the fold lines thereof;

positioning said folded composite strip between solderable

supports having opposed faces of said supports in contact with respective opposed ridges of said folded composite;

heating said composite strip to solder said ridges to respective ones of said supports and to solder adjacent folds of the same strip to each other; and

removing said adhesive by solvation in a solvent to form interleaved fins between said supports;

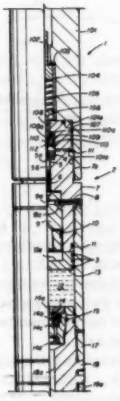
thereby producing a low cost, low impedance heat transport device of a minimal number of components which may be subject to standard stamping and forming operations.

4,535,842

WELL TOOL SETTING ASSEMBLY

Richard J. Ross, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Jul. 1, 1983, Ser. No. 510,210
Int. Cl.³ E21B *23/04*
U.S. Cl. 166—63 **6 Claims**



1. An apparatus for use in applying a force to a tool disposed at a sub-surface location in a well bore comprising:

a hollow housing having at least one port extending therethrough and communicable between the interior of the housing and the exterior well bore;

a valving piston axially shiftably mounted in the hollow housing for movement between a first position overlapping said port and a second position axially spaced from said port;

shearable means mounted in said port for closing said port and securing said valving piston in said first position;

means operating in response to an external signal for shifting said valving piston to said second position and thereby shearing said shearable means to open said port;

a first piston within the housing responsive to hydrostatic pressure in the well bore when the port is opened;

an actuating piston shiftable relative to the housing and having means for transmitting movement of the actuating piston to the well tool;

a hydraulic fluid disposed within the housing between the first piston and the actuating piston, the hydrostatic pressure force acting on the first piston being applied to the hydraulic fluid for driving the actuating piston; and

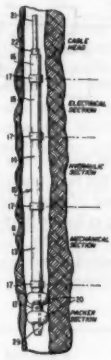
metering means disposed between the first piston and the actuating piston for establishing a pressure drop thereacross and for reducing the flow rate of fluid therethrough during the period from initiation until completion of movement of the actuating piston, whereby the actuating force applied through the actuating piston, and the rate at which the well wool is actuated, are determined by the well bore hydrostatic force and the metering means.

4,535,843

METHOD AND APPARATUS FOR OBTAINING SELECTED SAMPLES OF FORMATION FLUIDS

Alfred H. Jageler, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 380,689, May 21, 1982, abandoned. This application Jun. 8, 1984, Ser. No. 618,613
Int. Cl.³ E21B *49/08*
U.S. Cl. 166—250 **16 Claims**



1. A method for obtaining formation fluid samples from a bore hole which method comprises:

(a) lowering a tool suspended by a wireline into said bore hole to a preselected level;

(b) utilizing a pair of packers carried by said tool to isolate an interval of said bore hole by inflating said packers to expand them into sealing contact with said bore hole;

(c) withdrawing fluid from said isolated interval and measuring its resistivity in a resistivity test chamber within said tool and sending the resistivity measurement to the surface via said wireline;

(d) when the resistivity becomes constant, indicating that formation fluid uncontaminated by drilling mud components is being withdrawn into said tool, directing the withdrawn fluid into a second test chamber and measuring therein the redox potential, acidity and temperature of said fluid and sending results thereof to the surface by said wireline;

(e) determining from the thus transmitted results whether it is desired to retain a sample and, if the determination is positive, pumping said fluid to one of a plurality of sample collection chambers within said tool, if the determination is negative returning said fluid to said bore hole;

(f) deflating said packers to free said tool for vertical movement and moving said tool to another preselected location;

(g) repeating steps (b) through (f) until the sample chambers in said tool are filled with desired samples; and

(h) retracting said wireline to return the tool and the collected samples to the surface.

4,535,844

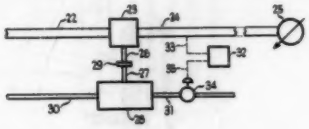
METHOD OF USING POLYMER FLOW CONTROL APPARATUS

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 20, 1983, Ser. No. 515,416
Int. Cl.³ E21B *43/22, 47/00*
U.S. Cl. 166—252 **7 Claims**

1. A method for controlling the flow of polymer solutions of the type employed as drive fluids and/or mobility control agents in the recovery of oil from subterranean oil-bearing reservoirs to prevent shear degradation of the polymer solu-

tion prior to introducing the polymer solution into an input well of an oil-bearing reservoir: comprising the steps of diluting the polymer solution to provide a concentration of the polymer in the solution sufficient to enable the solution to substantially meet the permeability requirements of the oil-bearing reservoir; passing the diluted polymer solution at one fluid pressure through flow control means to effect a lowering



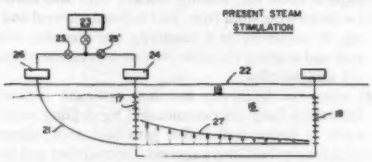
of the fluid pressure of the polymer solution while at the same time extracting from the flow control means the energy resulting from the lowering of the fluid pressure of the polymer solution; and utilizing at least a portion of the extracted energy to regulate the rate at which the polymer solution passes through the flow control means so as to minimize any shear degradation of the polymer solution as it undergoes a change in fluid pressure.

4,535,845

METHOD FOR PRODUCING VISCOUS HYDROCARBONS FROM DISCRETE SEGMENTS OF A SUBTERRANEAN LAYER

Alfred Brown; Wann-Sheng Huang, and Yick-Mow Shum, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,672
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—272 **2 Claims**



1. Method for producing viscous hydrocarbon from a productive substrate layer in which the hydrocarbon is releasably held, which method includes the steps of;

segregating a discrete vertical subsection of said substrate layer which is marginated between a pair of laterally spaced, substantially vertically oriented wells, and at least one other well, a portion of the latter being disposed substantially horizontal, and positioned adjacent to the bottom of the laterally spaced vertical wells,

said respective vertical walls and at least one other well, being perforated along a portion of the lengths thereof which contacts the productive substrate layer,

preheating said discrete vertical subsection,

introducing multi-directional flows of a pressurized heating medium concurrently from one of said vertical wells and the horizontal well respectively, into said vertical subsection to form thermal fronts in the productive layer, which fronts combine to establish an aggregate thermal front which is urged toward the other of said laterally spaced vertically oriented wells,

producing hydrocarbon from said other vertically oriented well,

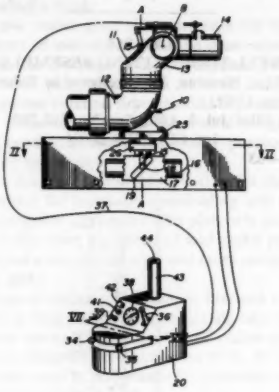
and the production of hydrocarbon from said vertical subsection by way of said at least one other well is achieved prior to the introduction of said multi-directional flows of heating medium thereto, and subsequent to said vertical subsection becoming preheated.

4,535,846

FIRE FIGHTING TURRET

John P. Gagliardo, Shrewsbury; Donald K. Morse, and Albert Pruneau, Jr., both of Worcester, all of Mass., assignors to Feecon Corporation, Westboro, Mass.

Filed Sep. 6, 1983, Ser. No. 529,329
Int. Cl.³ A62C *31/02*; B05B *13/04*
U.S. Cl. 169—25 **7 Claims**



1. Fire fighting turret, comprising:

(a) a nozzle apparatus, including a main body adapted to receive fluid under pressure, an intermediate body mounted on the main body for swinging motion about a vertical axis, and a nozzle mounted on the intermediate body for movement about a horizontal axis,

(b) a control rod extending through the main body and the intermediate body, mounted therein for vertical sliding movement, and connected at its upper end to the nozzle for bringing about the said movement about a horizontal axis,

(c) an elevation cylinder mounted in fixed relationship to the main body, and

(d) an actuating element with an inclined slot, a vertical slot, and a guide element riding in the slots, the elements joining a movable element of the cylinder and the control rod to bring about vertical movement of the rod when the cylinder is energized.

4,535,847

TRACTOR WITH THREE-POINT LINKAGE CONNECTING SCRAPER THERETO AND AUTOMATIC TILT CONTROL

Shigekazu Hasegawa, Sakai; Naoki Okita, Nara, and Satoshi Machida, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 2, 1983, Ser. No. 490,806
Claims priority, application Japan, Oct. 29, 1982, 57-191712
Int. Cl.³ A01B *65/02*
U.S. Cl. 172—2 **11 Claims**

1. A tractor comprising:

a tractor body;

a scraper;

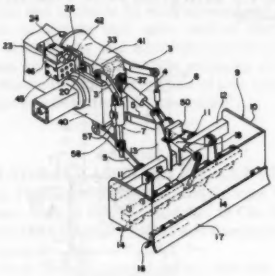
a three-point linkage means for connecting said scraper to said tractor body, said linkage means including a top central link means and left and right lower link means;

a pair of lift arm means connected to said left and right lower link means, a hydraulic operated cylinder connected to said lift arm means for raising and lowering said scraper;

a position controlling mechanism, a hand lever operatively connected thereto, said controlling mechanism being adapted to control said hydraulic operated cylinder to raise

and lower said scraper to a position corresponding to a position selected by said hand lever and which automatically retains said scraper in said position;

a first hydraulic actuator included in one of said pair of lift arm means for rolling adjustment of said scraper;



a sensor for detecting right and left slant postures of said scraper, said sensor generating a tilt detection signal; and

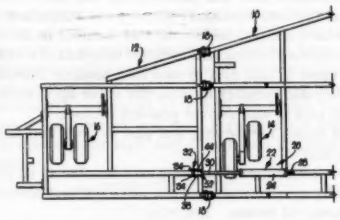
an automatic control mechanism responsive to said tilt detection signal for actuating said first hydraulic actuator for automatically correcting the slant posture of said scraper.

4,535,848

WING LIFT FOR FOLDABLE IMPLEMENTS

Billy J. Pfenninger, and F. Harrison Stansel, both of Hutchinson, Kans., assignors to Krause Plow Corporation, Hutchinson, Kans.

Filed Aug. 17, 1983, Ser. No. 523,958
Int. Cl.³ A01B *63/32*
U.S. Cl. 172—311 **5 Claims**



1. In a farm implement having a normally horizontal, main, wheel-supported frame and a wheel-supported wing frame having a normally horizontal position and provided with hinge means pivotally attaching the same to the main frame for up and down swinging movement about a normally horizontal, fore and aft axis, mechanism normally overlying the frames for swinging the wing frame about said hinge means from said horizontal position to an upright position and thence to a folded position overlying the main frame with said mechanism disposed between the frames, said mechanism including:

an elongated, double-acting, fluid pressure, piston and cylinder assembly having a longitudinal axis, said assembly being provided with a cylinder having means at one end thereof pivotally connecting the same to said main frame remote from the hinge means and a reciprocable piston rod having an outermost end and extending outwardly from the opposite end of the cylinder;

a single, elongated, normally upstanding arm having its longitudinal axis angularly offset relative to the longitudinal axis of said assembly when the wing frame is in said horizontal position;

means pivotally connecting the arm directly to the wing, frame at the normally lowermost end of the arm adjacent, but spaced from the hinge means;

a knee joint adjacent the uppermost end of the arm presenting an articulation between the arm and the outermost end of the rod whereby, upon retraction of the rod, a pulling force is applied to the joint to raise the wing frame from said horizontal position to said upright position and to move said axis of the arm into alignment with said axis of the assembly until the wing frame reaches the folded position;

an upstanding lug rigid to the wing frame said disposed between the arm and the hinge means for engagement by the arm and transmitting said pulling force from the assembly to the wing frame,

a block secured to the rod at the outermost end of the latter;

means pivotally connecting the block to the arm at the normally uppermost end of the arm; presenting a knee joint; and

stop means rigidly secured to said arm and spaced from said main frame and said wing frame,

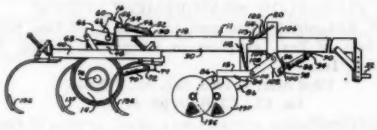
said stop means being disposed for cooperative engagement with said block as said axis of said assembly and said axis of said arm become aligned such that downward jackknifing of said knee joint is precluded.

4,535,849

IMPLEMENT WITH HORIZONTAL LINKAGE DEPTH CONTROL

William J. Dietrich, Sr., Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.

Filed Sep. 16, 1983, Ser. No. 532,678
Int. Cl.³ A01B *13/08*
U.S. Cl. 172—468 **11 Claims**



1. In a tillage apparatus adapted to be pulled by a vehicle, including a main frame adapted to carry a first set of ground working tools; wheel means coupled to said main frame for supporting and carrying said main frame; and first lift means coupled to said wheel means and main frame for raising and lowering said main frame, the improvement comprising: a sub-frame carried by said main frame at a location forward of said first set of tools; a second set of ground working tools mounted to said sub-frame, at least some tools of said second set being located forward of other tools of said second set; and a second lift means coupled to said main frame and said sub-frame for adjusting the height of said sub-frame, including a single rock shaft rotatably mounted to said main frame; power means coupled to said rock shaft for rotating it; and linkage means for mounting said sub-frame to said main frame and constructed and arranged to support said sub-frame while maintaining said sub-frame in horizontal disposition when said second set of tools are in working engagement with the soil, said linkage means comprising a first pair of generally parallel opposing links formed by a generally vertical frame extension of said main frame and said sub-frame respectively; and a second pair of generally parallel opposing links formed by a shaft arm rigidly attached to said rock shaft at one end and pivotally connected to said sub-frame at the other end, and a connecting link means pivotally mounted to said main frame vertical extension at one end and pivotally mounted to said sub-frame vertical extension at the other end.

4,535,850
POWER-OPERATED FASTENER TOOL

Robert H. Alexander, Columbia, S.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

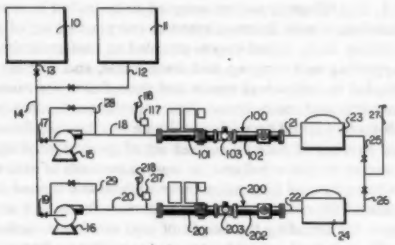
Continuation of Ser. No. 104,209, Jan. 6, 1971, abandoned. This application Mar. 8, 1982, Ser. No. 356,095
Int. Cl.³ B25B 23/14
U.S. Cl. 173—12 17 Claims

1. A power-operated tool for tightening fasteners comprising an air motor; an output member adapted to rotate a fastener engaging component; a speed reducing drive train means drive-connecting the motor of said tool to the output member therof, said motor and said drive train means including rotatable components; and means drive-connected between said drive train means and said output member providing an energy sink capable of absorbing substantially all of the kinetic energy generated by said rotatable motor and drive train means components whereby, as said fastener is tightened, the kinetic energy of said components is absorbed by said energy sink providing means and the speed of said motor is decreased to a speed below its no-load speed.

4,535,851
FLUID FLOW MEASUREMENT SYSTEM

Lloyd V. Kirkpatrick, Beaumont, and John R. McGee, Simonton, both of Tex., assignors to Kirkpatrick-McGee, Inc., Houston, Tex.

Filed Mar. 9, 1983, Ser. No. 473,645
Int. Cl.³ E21B 21/08, 44/00
U.S. Cl. 175—38 16 Claims



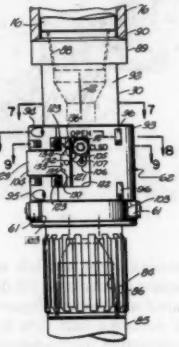
1. Apparatus for the measurement or control, or both, of the flow of a fluid over a wide range of flow conditions and compositions, which comprises:

a measurement primary device through which said fluid is passed, the primary measuring device being provided with a variable orifice primary, means for measuring density, and rate of flow of the fluid via differential pressure means located on opposite sides of said variable orifice, these measurements being input to a computer which calculates the density, viscosity and the compensated flow of the fluid, the computer controlling the variable orifice of the measurement primary in relation to input signals received from the measurement primary device.

4,535,852
DRILL STRING VALVE ACTUATOR

George I. Boyadjieff, Anaheim, and Igor Krasnov, Fountain Valley, both of Calif., assignors to Varco International, Inc., Orange, Calif.

Filed Dec. 27, 1983, Ser. No. 565,702
Int. Cl.³ E21B 21/10, 34/16; F16K 31/00
U.S. Cl. 175—170 21 Claims



1. A well pipe valve actuator comprising:

a tubular element to be connected to the upper end of a drill string and containing a passage through which fluid flows;

a valve within said tubular element actuable between an open position permitting fluid flow through said passage and a closed position preventing such flow;

a member for actuating said valve and which is mounted for pivotal movement about an axis relative to said tubular element to open and close the valve;

a part mounted near said member for movement between first and second positions relative to said tubular element and which is engageable with said member in an interfitting relation pivoting said member to open the valve upon movement of said part to said first position thereof, and pivoting said member to close the valve upon movement of said part to said second position thereof;

powered means for moving said part to open and close the valve; and

manual override means enabling said member to be pivoted manually to open and close the valve without actuation of said powered means;

said part being constructed and mounted to move out of interfitting relation with respect to said member upon arrival at at least one of said first and second positions of said part to avoid interferences by said part with manual actuation of the valve.

20. The combination comprising:

a top drive drilling unit including a housing, a tubular element rotatable relative to said housing and connectable to the upper end of a drill string, and a motor carried by said housing for driving said tubular element to turn the string;

an elongated support member connected to said drilling unit and projecting downwardly lower than said housing;

a first piston and cylinder mechanism suspended from a lower portion of said support member;

a torque wrench for making and breaking joints in the drill string and which is suspended by said piston and cylinder mechanism and is actuable upwardly and downwardly thereby;

at least one additional piston and cylinder mechanism suspended by said support member at a location spaced lower than said housing;

a valve for closing off the flow of fluid through said drill string; and

means actuable by said additional piston and cylinder mechanism to open and close said valve;

said tubular element of the top drive drilling unit having a tubular extension projecting downwardly therefrom and containing said valve;

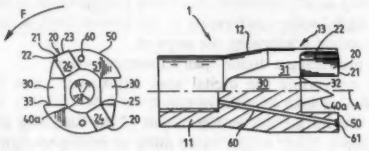
said means including a sleeve disposed about said tubular extension and movable upwardly and downwardly relative thereto and operable by such upward and downward movement to actuate said valve, and at least one lever structure actuable by said additional piston and cylinder mechanism and having a portion engaging an essentially annular relatively rotatable portion of said sleeve to actuate the sleeve upwardly and downwardly.

4,535,853

DRILL BIT FOR JET ASSISTED ROTARY DRILLING

Serge Ippolito, Freyming-Merlebach, and Georges A. Cagnioncle, Mulhouse, both of France, assignors to Charbonnages de France, Paris and Cocentall - Ateliers de Carspach, Mulhouse, both of, France

Filed Dec. 23, 1983, Ser. No. 564,804
Claims priority, application France, Dec. 23, 1982, 82 21674
Int. Cl.³ E21B *10/02*
U.S. Cl. 175—404 **20 Claims**



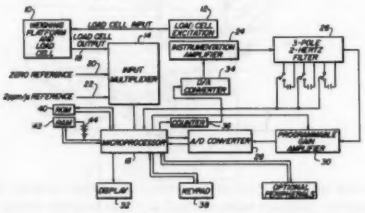
1. A rock drill bit for very high pressure jet assisted rotary drilling to be mounted to the end of a rotational drive rod for rotation around a rotational axis, comprising a body, a discontinuous peripheral crown axially extending from said body opposite to said rod, a central burster within said crown, at least two drilling plates inserted in said crown, having a small radial dimension and formed with working edges radially and axially projecting from said crown, said drilling plates being circumferentially separated by debris discharge ramps provided across said crown, and very high pressure fluid supply channels crossing through said crown and opening close to said plates.

4,535,854

CALIBRATION METHOD AND APPARATUS FOR AN ELECTRONIC WEIGHT INDICATOR

Eric A. Gard; William J. Kautter, Jr., both of Lancaster, and Kenneth E. Bartsch, Manheim, all of Pa., assignors to Pennsylvania Scale Company, Leola, Pa.

Filed Nov. 16, 1982, Ser. No. 442,026
Int. Cl.³ G01G *9/00, 19/34, 23/01, 23/14*
U.S. Cl. 177—1 **11 Claims**



1. A method of calibrating and correcting for changes after calibration in an electronic weight indicator adapted to convert an analog output of a load cell into a digital display with the aid of a digital computer comprising:

(a) initially calibrating the weight indicator to display, in digital form, a range of weights, the analog signal of which is produced by the load cell including inputing the computer with a data base including at least,

1. a zero reference measurement;
2. a deadload correction offset measurement;
3. a span measurement of the analog and A/D circuitry;
4. the data base corresponds to:

$$M = \frac{M\,Sig - M\,Bias}{M\,Ref - M\,Zero},$$

if the deadload correction is positive, and

$$M = \frac{M\,Sig - M\,Bias - (M\,Gref - M\,Zero)}{M\,Gref - M\,Zero},$$

if the deadload correction is negative where:

M=corrected measurement of load cell output;
M Sig=uncorrected measurement of load cell output;
M Zero=zero reference measurement;
M Gref=2 ppm/°C. reference measurement;
M Bias=measurement of deadload correction;

5. the deadload correction offset measurement is determined by a count contained in a counter;

(b) converting the analog output of the load cell to a digital value with the aid of an A/D converter;

(c) repetitively measuring the zero reference, the deadload correction offset, and the span of the analog and A/D circuitry;

(d) multiplexing the zero reference, deadload correction offset and span of the analog and A/D circuitry with the load cell output; and

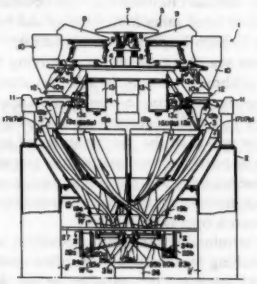
(e) normalizing the analog input to the zero, deadload correction offset and span measurements to obtain a displayed weight independent of all analog and A/D offsets and gains.

4,535,855

ARTICLE DISCHARGE APPARATUS AND METHOD IN AUTOMATIC WEIGHING SYSTEM

Asashiro Izumi, Kusatsu; Yoshiharu Mikami, and Seiji Yamada, both of Kyoto, all of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Dec. 29, 1983, Ser. No. 566,879
Claims priority, application Japan, Dec. 29, 1982, 57-234380; Jan. 28, 1983, 58-13053
Int. Cl.³ G01G *19/22*
U.S. Cl. 177—1 **10 Claims**



5. A method of discharging weighed articles in an automatic

weighing system, wherein weighed articles are collected and discharged by selectively introducing the weighed articles, released from a plurality of weighing hoppers, into first and second collecting routes of a collecting chute, said method comprising the steps of:

(a) temporarily gathering weighed articles at outlets of respective ones of the first and second collecting routes; and

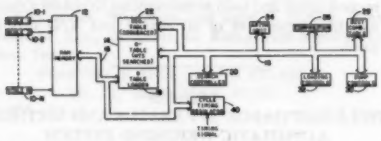
(b) selectively discharging the weighed articles from one of the outlets once the weighed articles have been gathered at the outlet, so that when weighed articles are released into one of the first and second collecting routes of the collecting chute from weighing hoppers selected by a combinatorial computation, said step (b) includes a step of discharging weighed articles previously gathered at the outlet corresponding to the one of the first and second collecting routes during the time needed for the weighed articles just released to reach the outlet via the one of the first and second collecting routes.

4,535,856

COMBINATION WEIGHING MACHINE HAVING SHORT SEARCH

Oren A. Mosher, Hayward, and Ellwood S. Douglas, Orinda, both of Calif., assignors to Package Machinery Co., East Longmeadow, Mass.

Filed Feb. 16, 1984, Ser. No. 580,847
Int. Cl.³ G01G *19/00, 19/22, 19/52*
U.S. Cl. 177—1 **18 Claims**



1. A combination weighing machine for forming a charge of product closely approximating a target amount in a cyclic machine operation comprising:

a plurality of weigh scales, each receiving a quantity of product in an amount preferably a fraction of the target amount and providing a data signal indicative of the quantity of product received;

arithmetic means for receiving the data signals from the scales in various combinations and combining the signals to produce total sums indicative of the total quantity of product in each respective combination;

combination searching means for supplying the data signals to the arithmetic means is selected combinations in a search sequence during a combination search operation;

comparator means for determining in the course of a search operation which of the combinations of scales have total sums most nearly approximating the target amount;

memory means for storing the searched combination most nearly approximating the target amount during the course of the search operation;

means for terminating the search operation of the combination searching means upon a specified condition whether the search sequence is completed or not; and

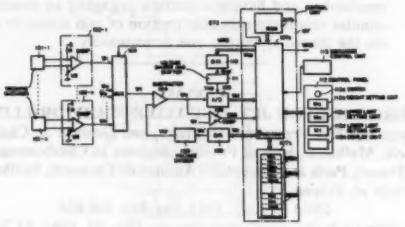
utilization means for receiving from the memory means the preferred combination at the termination of a search operation.

4,535,857

SPAN ADJUSTING METHOD AND APPARATUS

Setsuo Haze, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Apr. 27, 1984, Ser. No. 605,375
Claims priority, application Japan, Apr. 28, 1983, 58-075445
Int. Cl.³ G01G *19/52, 19/22, 23/14*; G01L *25/00*
U.S. Cl. 177—50 **10 Claims**



1. A span adjustment method for applying a known load to a weighing machine which produces an analog output, and effecting an adjustment so that a true weight value, in the form of a digital value conforming to the known load, is obtained, said method comprising the steps of:

(a) producing a digital span adjustment value;

(b) converting the digital span adjustment value into an analog span adjustment value;

(c) converting the analog output of the weighing machine into a digital output value using an analog-to-digital converter, and comparing the digital output value and the digital value conforming to the known load, while changing a conversion characteristic of the analog-to-digital converter in accordance with the analog span adjustment value; and

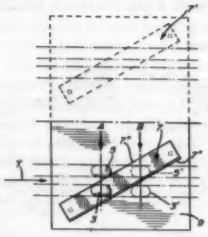
(d) sequentially changing the digital span adjustment value, in accordance with the relative sizes of the compared digital values, to obtain a true weight value, which conforms to the known load, as the digital output value produced as an output by the analog-to-digital converter.

4,535,858

WEIGHING SCALE FOR INDIVIDUAL WHEELS OF A TANDEM SET OF WHEELS

Pierre Provost, Vaudor, and Jean T. Bédard, Barfleur, both of Canada, assignors to Vaqua Pneumatique, Quebec, Canada

Filed Mar. 27, 1984, Ser. No. 593,935
Claims priority, application Canada, Dec. 9, 1983, 442926
Int. Cl.³ G01G *19/02, 21/24*
U.S. Cl. 177—134 **11 Claims**



1. A weighing scale for weighing, individually the loads on the wheels of a set of wheels of a vehicle mounted at either end of an axle in side-by-side relationship for movement along a

weighing surface in a direction transverse to the axis of the axle, said scale comprising:

a weighing element arranged substantially in said surface plane and having at least one side edge at an oblique angle to said direction of travel;

said weighing element being supported, in a vertical sense, solely by weight detector means.

4,535,859

VEHICLE

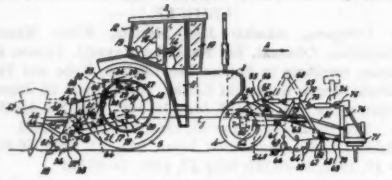
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Division of Ser. No. 445,738, Nov. 30, 1982, which is a continuation of Ser. No. 131,043, Mar. 17, 1980, Pat. No. 4,448,274. This application Feb. 29, 1984, Ser. No. 584,591

Claims priority, application Netherlands, Mar. 21, 1979, 7902198; Mar. 21, 1979, 7902199; Mar. 21, 1979, 7902200

Int. Cl.³ B60K *25/00*

U.S. Cl. 180—15 **19 Claims**



1. An agricultural tractor comprising an engine, wheels driven by said engine and a power take-off shaft driven by said engine with a rotational speed proportional to the rotational speed of said wheels, in combination with an agricultural implement which includes at least one rotational soil contacting member and coupling means which connects said soil contacting member with said power take-off shaft so that the rotational speed of said member is proportional to the rotational speed of said wheels and its operational peripheral speed is the same as the tractor's travelling speed, said member being constructed and arranged to avoid compaction of the soil which is adverse to plant growth and to improve traction of the combined tractor and said member.

4,535,860

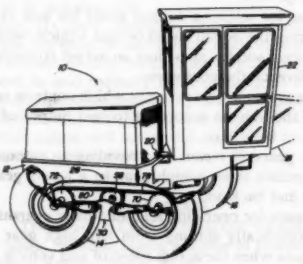
TANDEM DRIVE MOUNTING

Van E. Waggoner, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 30, 1982, Ser. No. 412,734

Int. Cl.³ B62D *61/10*

U.S. Cl. 180—24.05 **3 Claims**



1. In a tandem drive including a tandem housing having inner and outer vertical walls, a first circular opening provided in the inner wall centrally between opposite ends of the tandem housing, second and third circular openings provided in the outer wall at respective locations on opposite sides of and equidistant from the first opening, a final drive housing secured to the inner wall and supporting a drive shaft centrally within the first opening, and first and second axle housings respectively fixed to the outer wall and supporting first and second axles centrally within the second and third openings, the improvement comprising: at least one dowel pin provided in the inner wall and received in a locating hole in the final drive housing and at least two dowel pins provided in the outer wall with one each respectively received in a locating hole of each of the first and second axle housings; said one and two dowels being precisely located one to the other whereby the drive and first and second axle shafts are located precisely one to the other; said final drive and first and second axle housings respectively including annular surfaces engaged with a mating surface of the tandem housing located annularly about the first, second and third openings; and each annular surface being provided with an annular groove having a seal located therein.

4,535,861

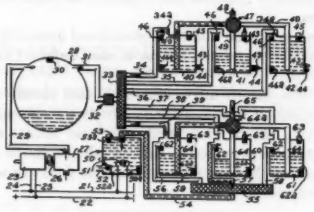
POWER SOURCE FROM GENERATING CAUSED BY BRAKING ELECTRIC POWERED VEHICLES

Janos Nagy, 2600 Monroe St., Hollywood, Fla. 33020

Filed Apr. 28, 1983, Ser. No. 489,376

Int. Cl.³ B60K *17/28, 25/00*

U.S. Cl. 180—53.5 **1 Claim**



1. A power source, comprising, in combination, a secondary circuit secured to the electrical motors of an electrically driven vehicle, and a hot and cold water pumping system secured to said secondary circuit; said secondary circuit being secured to the output side of said electrical motors of said electrically driven vehicle; the output side of said secondary circuit being connected to a compressor motor and a thermostatically controlled electric heating coil within a boiler for hot water, and said compressor motor filling a compressed air tank which supplies compressed air to a plurality of hot water tanks and a plurality of cold water tanks, to force hot water and cold water up in a tall building; and programmed valve and switch means whereby when one of said cold water tanks and one of said hot water tanks are in a now water supplying phase, another one of said cold water tanks, and another one of said hot water tanks are in a tank filling phase, and a third of said cold water tanks and a third of said hot water tanks are in a ready to supply phase for a continuous cold and hot water supply.

4,535,862

ENGINE COOLING SYSTEM FOR VEHICLES

James C. LeBlanc, 38261 Long St., Mt. Clemens, Mich.

Continuation-in-part of Ser. No. 287,042, Jul. 27, 1981, abandoned, which is a continuation of Ser. No. 145,604, May 1, 1980, abandoned, which is a division of Ser. No. 927,600, Jul. 21, 1978, abandoned. This application Oct. 29, 1982, Ser. No. 437,851

Int. Cl.³ B60L *11/00*

U.S. Cl. 180—68.1 **35 Claims**

1. In a vehicle having a body of monocoque construction and an engine mounted in said body, a cooling system comprising:

a means disposed on said body defining a plenum chamber

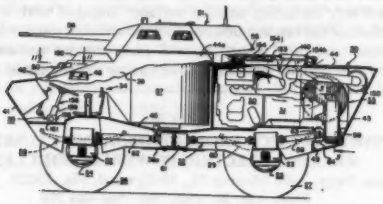
disposed between said engine and a side wall of said vehicle body,

an exhaust means associated with said plenum chamber,

a radiator disposed between an interior portion of said body including said engine and said plenum chamber, mounted substantially in a rear corner of said body, and operatively connected to said engine,

a fan mounted in said plenum chamber between said radiator and said exhaust means and adjacent said radiator,

a driving means for driving said fan, whereby upon operation of said fan air within the interior portion of said body



including said engine is drawn through said radiator and said plenum chamber and expelled through said exhaust means,

an access means on said body positioned generally over said engine for providing access to said engine from outside said body,

an air inlet means associated with said access means for providing air from outside said body to said radiator, and

a directing means associated with said access means for directing air provided by said air inlet means to said radiator so that the incoming ambient air does not scrub over said engine.

4,535,863

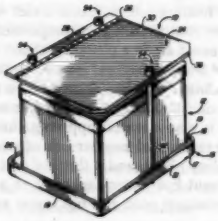
BATTERY SECURITY AND HOLD-DOWN DEVICE

John R. Becker, 3751 W. Crocus Dr., Phoenix, Ariz. 85029

Filed Aug. 26, 1983, Ser. No. 526,705

Int. Cl.³ E05B *73/00*; H01M *2/04*; B60R *18/02*

U.S. Cl. 180—68.5 **18 Claims**



1. A device for securing an electric storage battery against theft from a battery support tray provided in an automotive vehicle, said device comprising:

(a) at least a pair of stanchions for attachment to the battery support tray adjacent and upstanding from opposite side edges thereof, said pair of stanchions being elongated to locate their upper ends above the top of the battery when the battery is in the support tray and said pair of stanchions are attached thereto;

(b) fastener receiver means integrally formed on the upper end of each of said pair of stanchions;

(c) plate means for attachment to the upper ends of said pair of stanchions in overlaying relationship with the top of the battery when the battery is in the support tray and said pair of stanchions are attached thereto, said plate means including,

I. an elongated relatively narrow rigid flange for attachment to at least one of said pair of stanchions,

II. a rigid relatively wider battery cover flap for attachment to the other of said pair of stanchions,

III. a hinge interconnecting said flange and said flap; and

(d) at least a pair of security fastener means each for engaging said plate means and one of said fastener receiver means for attaching and deterring removal of said plate means from said fastener receiver means.

4,535,864

CRUISE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

Kou Tanigawa, Akashi; Jiro Masuda, Kobe; Kazumasa Nakamura, Okazaki, and Kazuhiko Hayashi, Toyota, all of Japan, assignors to Fujitsu Ten Limited, Kobe and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Division of Ser. No. 382,413, May 26, 1982, Pat. No. 4,463,822.

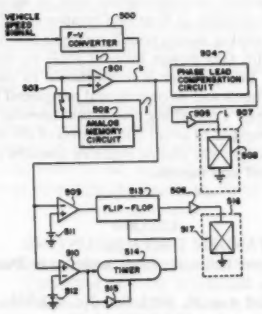
This application May 29, 1984, Ser. No. 614,861

Claims priority, application Japan, May 27, 1981, 56-80286; May 27, 1981, 56-80287; May 27, 1981, 56-80288

The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—177 **3 Claims**



1. A cruise control system for controlling the speed of a vehicle, comprising

first means for setting a desired speed for said vehicle, for comparing the actual speed of said vehicle with said desired speed, and for providing an output corresponding to the difference therebetween,

a negative pressure type actuator which controls an accelerator of the vehicle according to said output of said first means,

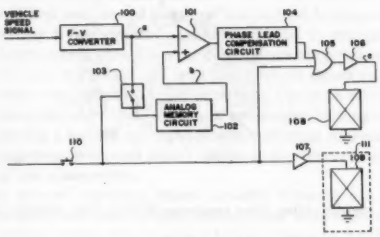
automatic gearshift means for providing an automatic gearshift function from a high gear to a lower gear of said vehicle and back and,

second means for operating said automatic gearshift means, for automatically shifting from said high gear into said lower gear when the actual speed of said vehicle is at least a first predetermined amount less than said desired speed, and for shifting back to said high gear at a predetermined time with respect to when the actual speed comes within a second predetermined amount of said desired speed, said first predetermined amount being larger than said second predetermined amount.

4,535,865
CRUISE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

Kou Tanigawa, Akashi; Jiro Masuda, Kobe; Kazumasa Nakamura, Okazaki, and Kazuhiko Hayashi, Toyota, all of Japan, assignors to Fujitsu Ten Limited, Kobe and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 614,861, May 29, 1984, which is a division of Ser. No. 382,413, May 26, 1982, Pat. No. 4,463,822.
This application Dec. 24, 1984, Ser. No. 685,541
Claims priority, application Japan, May 27, 1981, 56-80287; May 27, 1981, 56-80288; May 27, 1981, 56-80286
Int. Cl.³ B60K *31/00*
U.S. Cl. 180—177 **4 Claims**



1. A system for controlling the speed of a vehicle having an accelerator operated by an operator and a transmission, said system comprising:

means for producing a speed signal corresponding to the speed of said vehicle,

a memory for inputting, storing and outputting a value corresponding to a selected speed of said vehicle,

a comparator for comparing the output of said memory and said speed signal and for providing a corresponding output signal when the speed signal is less than said output of said memory,

an actuator, linked to said accelerator, for depressing said accelerator for increasing the speed of said vehicle in response to an input signal to said actuator,

shift means for shifting said transmission from a higher gear to a lower gear in response to an input signal thereto, and for shifting back to said high gear after said input thereto ceases,

increase set switch means for changing said value stored in said memory, in correspondence to the vehicle speed during the operation of the increase means, and for providing said input signal to said shift means, and

an OR circuit having as inputs the signals corresponding to said output signal of said comparator and to said input of said shift means, and having an output that provides said input to said actuator,

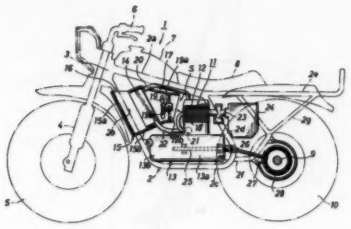
wherein, (1) upon operation of said increase set switch means, the speed of said vehicle tends to increase, (2) upon the release of said increase set switch means, a value is stored in said memory corresponding to a value of the vehicle speed during the operation of said increase set switch means, and (3) after said release of said increase set switch means, said actuator is controlled according to the output of said comparator.

4,535,866
THREE-WHEELED MOTOR VEHICLE

Mitsuo Shiga, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,734
Claims priority, application Japan, Apr. 22, 1982, 57-68524
Int. Cl.³ B60K *11/04*
U.S. Cl. 180—215 **6 Claims**

1. A three-wheeled motor vehicle including a frame, one steerable front wheel attached to said frame, two rear wheels attached to said frame and serving as drive wheels, a fuel tank mounted on an upper portion of said frame, a seat mounted on said frame behind said fuel tank, an engine mounted on a lower portion of said frame, said engine being a water cooled engine and comprising a cylinder portion comprising a cylinder head

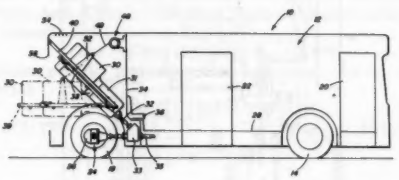


and cylinder block and a crankcase portion which underlies said cylinder portion, a transmission case integral with said crankcase portion having a transmission-containing portion forward of said crankcase portion, and a radiator being disposed within a space formed in front of said cylinder portion of said engine.

4,535,867
VERTICALLY INCLINED ENGINE LOW FLOOR BUS

Bela Botar, 10205 Collins Ave., Miami, Fla. 33154

Continuation-in-part of Ser. No. 388,119, Jun. 14, 1982. This application Sep. 24, 1982, Ser. No. 423,849
Int. Cl.³ B60K *5/00*
U.S. Cl. 180—294 **4 Claims**



1. A vertically inclined engine bus comprising a bus body having front steerable wheels and rear drive wheels interconnected by a drive axle assembly, a floor, and drive motor and transmission means connected to the drive axle assembly, said drive, motor and transmission means being disposed in vertically inclined position above the drive axle assembly thereby enabling the drive axle assembly and rear wheels to be oriented closer to the rear of the body and increasing the wheelbase without increasing the overall length of the bus, said body having a rear wall providing a partition between the rear of the floor and the compartment receiving the drive motor and transmission means, said floor being disposed in a single plane and extending forwardly from the rear axle assembly and positioned in a horizontal plane below the upper limit of movement of the drive axle assembly whereby the floor may be positioned closer to the ground surface, and a rearmost seat assembly affixed to the body forwardly of the rear wall in a manner eliminating access to the rear engine compartment through said partition provided by the rear wall, said drive motor and transmission means being supported from a sub-frame, means pivotally supporting the lower end of the sub-frame from the body to enable the drive mtor and transmission means to swing down and slide rearwardly to a generally horizontal position extending rearwardly longitudinally of the body for easy access to all areas of the drive motor and transmission means, said sub-frame being retained in upwardly

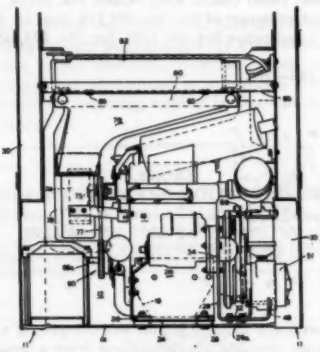
extending position by removable fastener means adjacent the upper end thereof, winch means for raising and lowering the sub-frame, drive motor and transmission means about a transverse axis defined by the pivotal support means.

4,535,868

TRANSVERSE ENGINE MOUNTING

Joseph M. Mather, Lisbon, and Larry E. Albright, Gwinner, both of N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Jun. 8, 1983, Ser. No. 502,409
Int. Cl.³ B62D *11/04*
U.S. Cl. 180—297 **13 Claims**



1. A mounting arrangement for the engine and pump mechanism of a hydrostatic drive vehicle which has two frame side members and a frame cross member extending between the two frame side members near one end of the vehicle comprising

a longitudinally extending first bracket located adjacent one frame side member and connected thereto by a vibration dampening connection,

one end of the engine and one end of the pump mechanism rigidly connected to said first bracket,

the engine and the pump mechanism being located transversely of the frame,

a second transverse bracket rigidly connected to the engine and connected by at least one vibration dampening connection to the frame cross member,

a third engine-pump bracket rigidly connected to the engine adjacent the other end thereof and rigidly connected to the pump mechanism, and

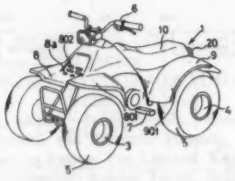
a fourth pump-frame bracket rigidly connected adjacent the other end of the pump mechanism and connected to the other frame side member by a vibration dampening connection.

4,535,869

SADDLE RIDING TYPE MOTORCAR HAVING FOUR WHEELS

Shinobu Tsutsumikoshi, Lamirada; Akira Goto, Fullerton, both of Calif.; Tsuyoshi Murakami; Masao Takasaka, both of Hamamatsu, Japan, and Yoshiki Shinohara, Hamamatsu, Japan, assignors to Suzuki Motor Company Limited, Kamimura, Japan

Filed Jan. 31, 1983, Ser. No. 462,236
Claims priority, application Japan, Feb. 5, 1982, 57-017324; Feb. 6, 1982, 57-017768; Nov. 13, 1982, 57-199640; Nov. 13, 1982, 57-199641
Int. Cl.³ B62J *15/00*; B62K *5/00, 11/02*
U.S. Cl. 180—311 **13 Claims**



1. A saddle riding type motorcar having four wheels comprising:

two front wheels and two rear wheels;

a frame structure comprising a pair of upper frames, a pair of lower frames and a plurality of spacer frames;

said pair of upper frames comprising a pair of fore end portions extending downward from a bent portion of each upper frame at a forward inclination angle and a pair of inclined portions extending rearward a certain distance at a gentle downward slope;

said pair of lower frames being fixedly connected to the pair of upper frames by a fore axle at their fore ends and by vertically extending frames at their rear ends;

said spacer frames extending in the transverse direction relative to the upper and lower frames and connecting one of the upper frames to the other upper frame and one of the lower frames to the other lower frame;

a steering head disposed at said bent portion of the upper frames;

front wheel supporting sections disposed at both the end parts of the fore axle; and

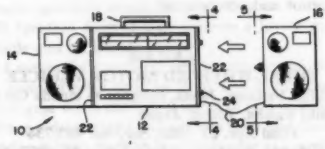
rear wheel supporting sections disposed at the rearmost end parts of the lower frames.

4,535,870

QUICK ATTACH-DETACH MECHANISM FOR AUDIO COMPONENTS

Paul H. Lindsay, Vernon, N.Y., assignor to General Electric Company, Portsmouth, Va.

Filed Nov. 15, 1984, Ser. No. 671,624
Int. Cl.³ G10K *10/00*
U.S. Cl. 181—141 **12 Claims**



1. In a portable audio apparatus including at least two components having separate housings, a quick attach-detach mechanism for selectively locking the components into a substantially rigid and vibration free integrated unit and selectively

releasing the components for stand-alone operation, said quick attach-detach mechanism comprising:

a plurality of studs projecting from a first one of said housings along spaced-apart parallel axes,

resilient means on a second one of said housings located thereonto abut the distal ends of said studs when the components are positioned to form an integrated unit, said resilient means being resiliently compressible along the axes of said studs,

a first locking means projecting outwardly from a selected one of said first and second housings along an axis parallel to the axes of said studs at least when the components are positioned to form an integrated unit, and first locking means having detent means thereon,

a second locking means carried by the non-selected one of said first and second housings, said second locking means having a first operatve position adapted to engage said detent means only when the components are positioned to form an integrated unit with said resilient means substantially compressed to apply separating forces on said studs along the axes of said studs, and said second locking means having a second operative position adapted to avoid engagement with said detent means in all relative positions of the components,

and manual operating means movable between a latched position and an unlatched position, said manual operating means coupled to said second locking means such that said second locking means is in its first operative position when said manual operating means is in its latched position and said second locking means is in its second operative position when said manual operating means is in its unlatched position,

said second locking means and said manual operating means being normally biased toward said respective first operative and latched positions,

whereby manual movement of said manual operating means to its unlatched position when the components comprise an integrated unit will move said second locking means to its second operative position to disengage said first locking means and permit separation of the components as a result of the separating forces exerted on the distal ends of said studs by said resilient means.

4,535,871

UNITARY STAIRWAY

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 306,585, Sep. 28, 1981, abandoned. This application Jul. 26, 1982, Ser. No. 402,218

Int. Cl.³ E06C *9/02*; B63B *29/20*

U.S. Cl. 182—93 **9 Claims**

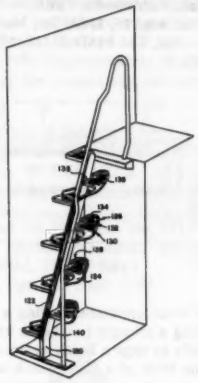
1. A stairway comprising:

a central tread support member having a first side, a second side, a front edge and a rear edge, said central tread support member adapted for mounting between an upper level and a lower level;

a plurality of tread members including an uppermost member, a lowermost member and middle members, said middle members disposed in alternating arrangement on said first and second sides of the central tread support member, each of said middle members having a rearward periphery, an inner edge and a front edge; and

an upwardly extending flange about the rearward periphery of the respective middle members to serve as a stop to a user's foot, said flange having a substantially vertical inward facing surface; an edge of said flange confronting said rear edge of the central support member;

selected ones of said middle members including a recessed mounting portion along the inner edge of the respective middle members adjacent the front edge of said middle members, said portion adapted to confront one of said sides of the central tread support member when said central tread support member and respective middle members are disposed in assembled relation.



4,535,872

RETARDERS SUITABLE FOR WAGON SPEED CONTROL AND HAVING MEANS FOR HOLDING THEM IN THEIR OPERATIVE CONDITION

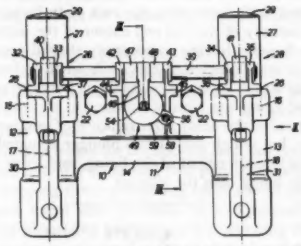
David E. Bick, Newent; Christopher F. Flippance, and Ian C. Parry, both of Cheltenham, all of England, assignors to Dowty Hydraulic Units Limited, England

Filed Sep. 21, 1982, Ser. No. 420,889

Claims priority, application United Kingdom, Oct. 6, 1981, 8130165

Int. Cl.³ B61K *7/02*

U.S. Cl. 188—62 **15 Claims**



1. A retarder, suitable for reducing the speed of a wagon rolling along a railway track, including a retainer which is adapted to be secured with respect to a rail of said track, an hydraulic unit which is so fitted to said retainer that a portion thereof, which normally projects from the retainer thus to lie in the path of a wheel of said wagon so as to be engageable by that wheel, is movable inwardly of said retainer to a position out of said path in which it permits said wheel to pass said retarder, and holding means movable into engagement with said portion for maintaining said portion in that position, wherein said portion of said hydraulic unit is so movable inwardly of said retainer by said wheel as in rolling along said rail it engages said portion.

4,535,873

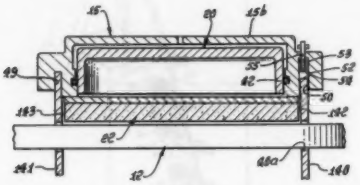
COMPACT HIGH PERFORMANCE DISC BRAKE

Franklin B. Airheart, Sacramento, Calif., assignor to Alston Industries, Inc., Sacramento, Calif.

Filed Aug. 15, 1983, Ser. No. 523,154

Int. Cl.³ F16D 55/18, 65/00

U.S. Cl. 188—72.4 10 Claims



1. In caliper brake apparatus having a caliper housing, an actuator including a plunger having an axis and movable axially longitudinally to urge a lining against a rotating disc, the lining having the form of a plate which is laterally elongated and defining a plane generally perpendicular to said axis, the improvement combination comprising

(a) said plunger having cross sections in planes normal to said axis and characterized as laterally elongated and as having lateral length dimensions which are substantially greater than the plunger transverse width dimension, said width dimension being generally normal to said axis and to said lateral length dimension, and

(b) said actuator having a recess receiving said plunger, said recess having cross sections in planes normal to said longitudinal axis characterized as conforming in shape to said plunger cross sections, said plunger and recess cross sections having kidney shaped outlines,

(c) the housing removably supporting the lining, and including laterally spaced end plates carried by the housing and confining opposite ends of said lining therebetween, at least one end plate being removable to permit endwise removal and replacement of the lining, the housing defining at least one slot proximate ends of the lining and plunger and slidably receiving at least one of said end plates, with said end plate freely projecting outwardly of the slot and having an external tang for lift-out removal, relative to the slot, each slot and end plate extending inward sufficiently that the end plate faces substantially the entirety of the full end extent of the lining,

(d) the housing having transversely shaped shoulders defining at least one ledge spaced from the plunger and between which, portions of the lining between opposite ends of the lining, are loosely confined to accomodate endwise removal of the lining after removal of said removable end plate, but which also allows plunger actuated axial longitudinal displacement of the lining, said ledge being closer to the lining than the plunger.

4,535,874

CARRIER FOR BRAKE LININGS FOR DISK BRAKES HAVING DIVIDED LINING ELEMENTS

Hans Pollinger, Munich; Eckart Saumweber, Gauting; Mathias Schörwerth, Geretsried, and Xaver Wirth, Ismaning, all of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

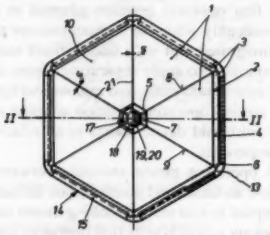
Filed Aug. 5, 1983, Ser. No. 520,628

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1982, 3231279

Int. Cl.³ F16D 69/04

U.S. Cl. 188—73.1 10 Claims

1. A brake lining carrier for disc brakes having divided lining elements, particularly for rail vehicles, comprising a base plate having one side detachably mountable on a brake lining support member and a second side, means on the edge portion of said second side of said base plate for defining a frame having a perimeter, said frame having a lip bent away from said edge portion to define a groove, a plurality of brake lining elements disposed laterally on said second side of said base plate and within said frame to define a friction lining block having a friction braking surface, each of said brake lining elements being fixed upon a carrier plate having projecting flange portions on at least two longitudinal sides of the brake lining element and substantially flush on remaining sides of the brake lining element, most of the adjacent brake lining elements being in contact with each other along their respective lateral sides, said frame perimeter enclosing the friction lining block defined by said plurality of mounted brake lining elements, said friction lining block having an open central portion, a layer of resilient material interposed between said friction lining block



and said base plate, the projecting flange portions on the outer longitudinal sides of said brake lining elements being received within said groove, the projecting flange portions on the inner longitudinal sides of said brake lining elements extending into said open central portion, clamping means disposed in the open central portion of said friction lining block for exerting a force perpendicular to said friction surface against said flange portion extending into the open central portion to retain said flange portions, said brake lining elements within said frame having a lateral play parallel to said friction braking surface such that in the direction of friction force occurring on the friction surface during braking, the brake lining elements can be positioned against each other and can be supported jointly against said frame while mutually supporting each other.

4,535,875

ACTUATOR FOR AN INTERNAL SHOE DRUM BRAKE

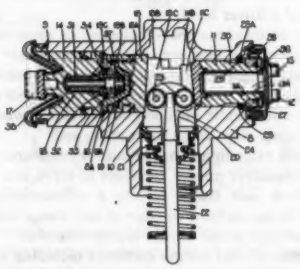
Brian Ingram, Coventry, and Michael J. England, West Midlands, both of England, assignors to Lucas Industries, Public Limited Company, Birmingham, England

Filed Mar. 3, 1983, Ser. No. 471,711

Claims priority, application United Kingdom, Mar. 9, 1982, 8206792

Int. Cl.³ F16D 65/24

U.S. Cl. 188—106 F 12 Claims



1. In an actuator for a shoe drum brake, having an actuator

body, an actuating wedge disposed between a pair of force-transmitting tappets slidable in opposed bores of the actuator body and intended, in use, to transmit actuating force to a pair of brake shoes to expand the brake shoes, one of the tappets being split to form outer and inner pistons with a hydraulic chamber between them to permit the pistons to be urged in opposed directions by the application of hydraulic pressure to the chamber, the improvement comprising:

a respective automatic adjustment means operatively associated with each tappet to maintain a substantially constant shoe-to-drum clearance;

the adjustment means associated with the split tappet comprising,

a rotatable screw-threaded member between the inner and outer pistons,

a screw thread on said outer piston cooperatively engaging with said screw-threaded member,

abutment means disposed between the inner and outer pistons,

abutment engaging means on the actuator body, means to resiliently urge said abutment means away from said outer piston into engagement with said abutment engaging means, and

clutch means operatively engaging said screw-threaded member and said abutment means to control rotation of said screw-threaded member in response to outward movement of said outer piston,

so that said outer piston is adjusted independently of the tappet on the other side of the wedge.

4,535,876

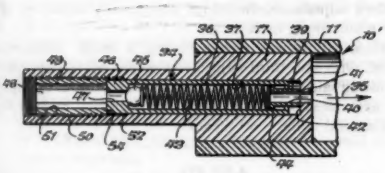
SHOCK ABSORBER CONSTRUCTION

Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Mar. 16, 1983, Ser. No. 475,914

Int. Cl.³ F16F 9/18; F16D 51/00

U.S. Cl. 188—311 **8 Claims**



1. A shock absorber comprising a casing having first and second ends, a chamber in said casing for containing fluid, a piston head in said chamber, a piston rod mounting said piston head and extending through said first end, means at said first end of said casing for supporting said piston rod for sliding movement, bleed means in said casing for providing said fluid to said chamber from an area external of said casing, reversible check valve means mountable in first and second positions on said casing for causing said shock absorber to provide shock absorption in a first direction of piston movement when said check valve means is in said first position and for causing said shock absorber to provide shock absorption in a second direction which is opposite to said first direction when said check valve means is in said second position, said check valve means comprising a cartridge, said cartridge comprising an elongated housing having first and second housing ends, a housing orifice in said first end, a check valve member, an elongated spring extending between said check valve member and said second housing end for biasing said check valve member toward said housing orifice in said first housing end, means at said second end of said casing for mounting said cartridge, an end wall at said second end of said casing, a bore in said end wall, an opening in said second housing end, spring pressing means mounted in said opening in said second housing end for bearing on the end of said spring remote from said check valve member, retaining means for retaining said cartridge in said bore in said second end wall, said spring pressing means comprising a presser member extending through said opening in said second housing end, a first end on said presser member for engaging said spring, and a second end on said presser member for receiving a force for effecting movement of said presser member into said cartridge for compressing said spring.

4,535,877

HYDRAULIC DAMPER OF ADJUSTABLE DAMPING FORCE TYPE

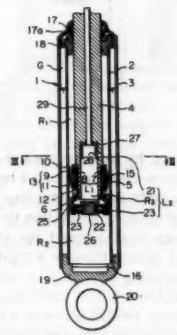
Akihiro Shimokura, Tokyo, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Jul. 13, 1983, Ser. No. 513,272

Claims priority, application Japan, Jul. 14, 1982, 57-106598[U]; Jul. 14, 1982, 57-106599[U]

Int. Cl.³ F16F 9/44

U.S. Cl. 188—319 **6 Claims**



1. A hydraulic damper of the adjustable damping force type comprising:

a piston working in a cylinder and partitioning the interior thereof into two liquid chambers;

a piston rod secured to said piston and extending to the outside of said cylinder;

a first passage means for connecting said two liquid chambers;

a first damping force generating valve means comprising first and second oppositely opening resilient valve disc means provided in said first passage means for generating a relatively high damping force both in the extension and contraction strokes of said damper;

a second passage means for connecting said two liquid chambers independently from said first passage means;

a second damping force generating valve means comprising a resilient valve disc provided in said second passage means for generating a relatively low damping force both in the extension and contraction strokes of said damper as said valve disc opens in respective opposite directions; and

adjusting valve means provided in said piston rod and controlling the effective passage area of said second passage means.

4,535,878

PILLOW-TOTE BAG DEVICE

Norma S. Grahl, 831 Cleveland St., Greenville, S.C. 29601

Filed Sep. 21, 1984, Ser. No. 653,087

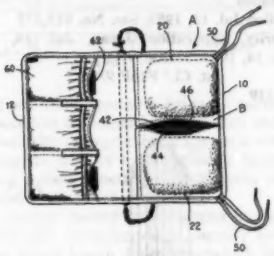
Int. Cl.³ A45C 9/00

U.S. Cl. 190—1 **17 Claims**

1. A pillow-tote bag device for use as a pillow and a tote comprising:

a pillow panel;

a pocket panel integral with said pillow panel;
a central casing extending across a width of said panels;
a generally rigid spine member received in said casing to provide a non-sagging configuration for said bag device;
an air mask carried by said pillow panel including an air opening formed in said pillow panel for breathing;
bifurcated pillow means carried by said pillow panel generally overlying said air mask;
said bifurcated pillow means including two separable generally rectangular pillow cushions carried on adjacent sides of said air mask having juxtaposed edges which are separable to provide access to said air mask for breathing and being closable to cover said air mask;



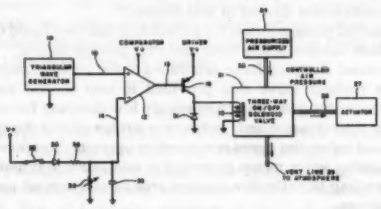
closure means carried by said juxtaposed edges for closing said separable pillow cushions along a length of said edges to form a head cradle sling connecting said pillow cushions together and resisting separation thereof to provide a continuous unitary head support for supporting a back head portion of a person lying in a supine position; and
said closure means being openable to separate said juxtaposed edges of said two pillow cushions along their length for providing access to said air mask when said person is lying in a prone position with his face supported on said bifurcated pillow means.

4,535,879

CONTROL SYSTEM FOR CONTROLLING THE ENGAGEMENT OF A PRESSURE-OPERATED ACTUATOR

Fred D. Sturges, Rockford, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 29, 1984, Ser. No. 584,565
Int. Cl.³ F16D *11/06*
U.S. Cl. 192—52 **12 Claims**



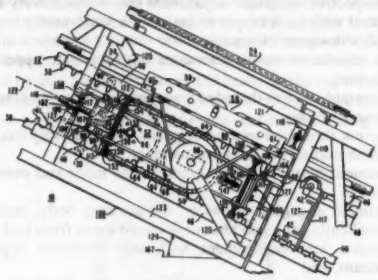
1. A control system for controlling the rate of engagement of a pressure-operated actuator, comprising:
means for developing a pulse width modulated signal having a duty cycle which gradually changes in a constant direction;
means responsive to said pulse width modulated signal for producing a gradually increasing fluid pressure;
and means for applying the gradually increasing fluid pressure to the actuator to effect a smooth engagement thereof.

4,535,880

ESCALATOR

Henry Boltrek, Freeport, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1983, Ser. No. 532,437
Int. Cl.³ B65B *9/12, 9/14*
U.S. Cl. 198—330 **8 Claims**



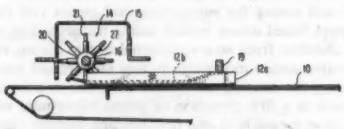
1. An escalator comprising:
a truss, said truss including a portion having a longitudinal axis inclined with respect to a horizontal plane,
a conveyor supported by said truss, a drive unit in said truss for driving said conveyor, said drive unit having X-, Y-, and Z-axes, with said X-axis being a longitudinal axis to be oriented parallel with the longitudinal axis of said truss, said Y-axis being perpendicular to said X-axis in a predetermined plane, and said Z-axis being perpendicular to the predetermined plane which includes the X- and Y- axes,
first adjustment means for positionally adjusting said drive unit along its Z-axis, and also about its X- and Y- axes,
second adjustment means for positionally adjusting said drive unit along its Y-axis, and also for positionally adjusting said drive unit about its Z-axis,
and third adjustment means for positionally adjusting said drive unit along its X-axis,
said third adjustment means having a single adjustment point, with said third adjustment means being capable of adjusting said drive unit along its X-axis without changing the associated positional adjustments selected by said first and second adjustment means.

4,535,881

SORTING APPARATUS FOR FOOD ITEMS

Herman Mims, 601 N. I-85, Charlotte, N.C. 28216

Filed Aug. 3, 1982, Ser. No. 404,733
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—420 **7 Claims**



1. Apparatus for arranging conveyed food items into one or more parallel lines of uniformly spaced food items, comprising:
a travelling web conveyor having a planar conveying surface for receiving food items to be conveyed and sorted, said food items having a thickness which is relatively smaller than a length or width dimension thereof;
a plurality of indexing rotary members disposed above said conveying surface for peripherially contacting and uniformly spacing said food items while said food items are being advanced by said conveyor; each of said rotary members having a plurality of spokes extending therefrom and respectively extending to aat least said conveying surface and each of said spokes being resiliently urged into

contact with said planar conveying surface, said spokes having a smaller horizontal velocity, at said conveying surface, than said conveying surface;

means for rotating said rotary members, said spokes being arranged such that a pair of spokes on one said rotary member may be in simultaneous contact with said planar conveying surface such that one spoke contacts said surface before a rotationally preceeding spoke leaves said surface, and said spokes of pairs of adjacent rotary members having a pitch in the lateral direction of said conveying surface which is less than a diameter of one of said food items, whereby a pair of said spokes substantially straddle one of said food items; and

guide means for guiding said food items in at least one parallel line to said rotary members.

4,535,882

METHOD AND APPARATUS FOR ARRANGING CAST-IRON PIPES IN ODD NUMBER STACKS

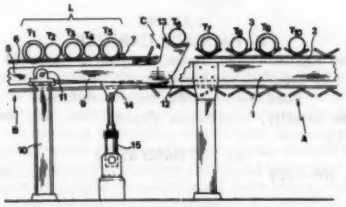
Roger Malivoir, Pont-a-Mousson, and Gilbert Mayer, Nancy, both of France, assignors to Pont-a-Mousson S.A., Nancy, France

Filed Nov. 3, 1983, Ser. No. 548,586

Claims priority, application France, Dec. 24, 1982, 82 21855

Int. Cl.³ B65G *47/30*

U.S. Cl. 198—425 **8 Claims**



3. An apparatus for arranging elongate pipes in horizontal, odd numbered beds, each pipe having a uniform male end and an enlarged female mouth end, and the pipes being delivered from a supply source in reversed pairs with a male end of one pipe adjacent a female end of the other pipe, comprising:

(a) a first, horizontally oriented upstream transporter (A) including spaced, parallel endless chains (2) and a plurality of V-shaped pipe supports (3) mounted on said chains at regular intervals,

(b) drive means (4) for intermittently advancing said first transporter in steps equal to twice the distance between adjacent pipe supports,

(c) a second, horizontally oriented downstream transporter (B) including spaced, parallel endless chains (6), said second transporter being disposed in series with the first transporter and such that an input end of the second transporter overlaps an output end of the first transporter,

(d) drive means (8) for continuously advancing said second transporter,

(e) a single pipe elevator (C) disposed between overlapping ends of the chains of the first and second transporters, and

(f) means (15) for selectively raising and lowering said elevator between a first position above the level of the chains and a second position below the level thereof.

4,535,883

SHOCK MOUNT TELESCOPING CONVEYOR BELT CLEANER

James F. Kerr, Croswell, Mich., assignor to Material Control, Inc., Croswell, Mich.

Continuation-in-part of Ser. No. 473,474, Mar. 9, 1983, abandoned. This application Jan. 24, 1984, Ser. No. 573,445

Int. Cl.³ B65G *45/00*

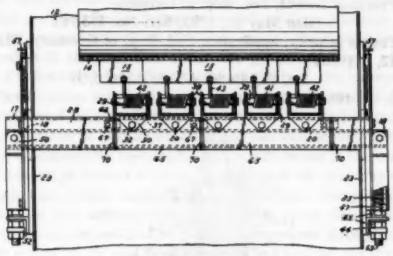
U.S. Cl. 198—499 **14 Claims**

1. A conveyor belt cleaner for use on a conveyor having an endless belt comprising:

an elongate support member having a first longitudinal axis adapted to extend transversely of the endless belt;

a blade carrying member having a blade affixed thereto and being carried by said support member and having a second longitudinal axis spaced from and parallel to said first longitudinal axis;

said blade carrying member including one or more blades adapted to scrape the endless conveyor belt;



rotatable means interposed between said support member and said blade carrying member for rolling the blade carrying member along the support member, said rotatable means being mounted for rotation on one of said members and in rolling contact with the other of said members; and

first and second mounting means interconnecting the elongate support and the conveyor at spaced locations for adjustably biasing said blade carrying member toward the endless belt.

4,535,884

BULK-HANDLING BELT CONVEYOR

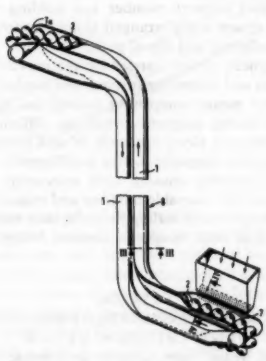
Anton Suppan, Röthenbach, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik, Nuremberg, Fed. Rep. of Germany

Filed Jan. 10, 1984, Ser. No. 569,750

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1983, 3300638

Int. Cl.³ B65G *15/14*

U.S. Cl. 198—626 **8 Claims**



1. A bulk-handling belt for a conveyor, comprising:

a flat conveyor belt having reinforced edges cooperative with guiding means of the conveyor for at least substantially closing the conveyor belt on itself along the reinforced edges into at least a trough of generally-circular cross section at least along a material-conveying run of the conveyor belt; and

a twisted, or spiral belt disposed along the flat conveyor belt and arranged to be substantially enclosed and entrained by the flat conveyor belt when said flat conveyor belt is substantially closed thereabout.

4,535,885

PNEUMATIC SEALING APPARATUS

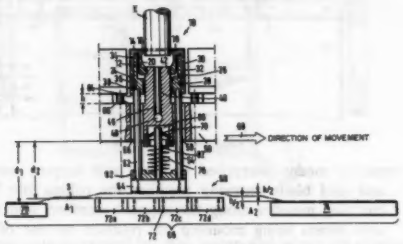
Karl-Heinz Grell, Ahrensburg, and Heinz Krappitz, Reinbek, both of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,752

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3219101

Int. Cl.³ B65G *47/86*; A24C *5/34*

U.S. Cl. 198—695 **16 Claims**



1. An apparatus for controlling the elastic deformation of the open end of a cylindrical sealing body between a closed position to momentarily enclose and seal around the end of a cylindrical article to be pneumatically tested and an enlarged open position, the sealing body mounted on a support member and attached to a holding member at the other end from the support member so that relative axial movement between the support member and holding member causes the opening and closing, the apparatus comprising:

means for carrying and moving said sealing body, said support member and said holding member along a travel path which is generally perpendicular to the axis of said sealing body, one of said members being axially movable relative to said carrying means and the other member being fixed thereon;

fixed control means for controlling relative movement between said support member and holding member, said control means being arranged along a control path generally paralleling said travel path;

a first magnetic device carried by the movable one of said members and extending toward said control means; and

said control means comprising second and third magnetic devices having magnetic properties differing from each other arranged along segments of said control path such that said first magnetic device is differently attracted and repelled thereby, causing axial movement of said first device and the movable member and concurrent opening and closing of said sealing body, at least one of said first, second and third magnetic devices being a permanent magnet.

4,535,886

FLAT PACKS FOR INCOHERENT PRODUCTS WITH ANTI-CRUSHING DEVICE

Emilio Salem, Milan, Italy, assignor to Novopac S.n.c. dei F.lli Salem E. & O., Italy

Filed May 9, 1984, Ser. No. 608,394

Claims priority, application Italy, Sep. 20, 1983, 23011B/83[U]

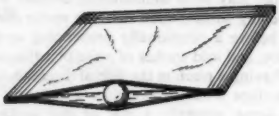
Int. Cl.³ B65D *75/54, 77/24*; B32B *3/00*

U.S. Cl. 206—205 **5 Claims**

1. A rupture-proof package comprising:

a plurality of sheet-like members sealed together;

an internal pocket formed from the plurality of sheet-like members the internal pocket containing:



an incoherent material; and

at least one support element.

4,535,887

IC PACKAGE CARRIER

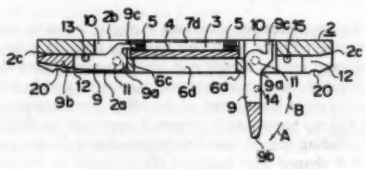
Yoshinori Egawa, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,943

Claims priority, application Japan, Nov. 10, 1983, 58-174566[U]

Int. Cl.³ B65D *85/62*

U.S. Cl. 206—328 **10 Claims**



1. A carrier for an IC package having rows of IC leads extended therefrom outwardly, which comprises:

a carrier body having a receiving section defined therein for accommodating therein said IC package,

a pair of latch levers disposed at the opposed sides of said receiving section and pivotally supported by the walls of said carrier body defining said receiving section as being rotatable about pivots between their respective locking positions and their respective unlocking positions, each of said pair of latch levers comprising a base portion at which the pivot is positioned, an operation portion for operating rotation of the latch lever, and a pair of fingers for supporting the corners of the rear surface of said IC package which are free from interference with said rows of IC leads and pinching said IC package in conjunction with the lower surface of said carrier body when the latch lever is in its locking position, said operation portion extending from said base portion upwardly of said carrier body and said pair of fingers extending from said base portion downwardly of said carrier body when the latch lever is in its unlocking position, and

engaging means provided on both said carrier body and each of said pair of latch levers for maintaining said IC package in the pinched state when said pair of latch levers are in their respective locking positions.

4,535,888

STORAGE CASSETTE FOR TWO OR MORE DISK-SHAPED HIGH MEMORY DENSITY INFORMATION CARRIERS

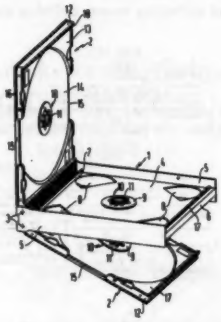
Frederik B. Nusselder, Bussum, Netherlands, assignor to Polygram GmbH, Fed. Rep. of Germany

Filed Jan. 16, 1984, Ser. No. 571,369

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301644

Int. Cl.³ B65D *85/30*

U.S. Cl. 206—444 8 Claims



1. A storage cassette for a plurality of disk-shaped information carriers, each having information tracks, a central area free of information tracks, and a central hole having an inner surface, comprising a box-like center part having a planar intermediate bottom floor and formed on two parallel sides by raised lateral sidewalls extending above and below said bottom floor, a pair of movable box-like cover parts having box floors for overlying said center part bottom floor above and below said bottom floor, hinge pivot bearings in said sidewalls of said center part for connecting together said center part and said cover parts at adjacent ends thereof such that said cover parts are movable toward or away from said center part, and a pair of tray parts for fitting in said cover parts respectively, each defining a disk-shaped trough having a centrally disposed raised seat for receiving and supporting one said information carrier and a central peg means carried on said seat for engaging the inner surface of said carrier's central hole to hold said information carrier adjacent said trough floor.

4,535,889

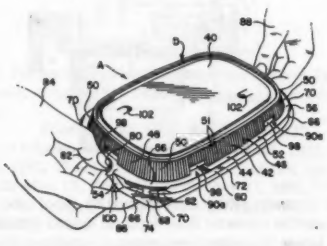
FROZEN FOOD PACKAGE AND COVER LID

Oskar R. Terauds, Willoughby, Ohio, assignor to The Stouffer Corporation, Solon, Ohio

Filed Feb. 8, 1984, Ser. No. 578,016

Int. Cl.³ B65D *43/10, 1/34*

U.S. Cl. 206—527 34 Claims



1. In a container comprised of a molded rigid plastic bottom tray with a surrounding laterally outward extending flanged rim of generally rectangular contour with gradually rounded corner portions, and an upper dome lid comprised of a semi-rigid sheet-like member of plastic material having a laterally outward extending annular seating flange matching the contour of, and seated against the upper surface of and locked onto the said rim of the tray, to join the tray and dome lid together into a unitary assembly, the said seating flange having a depending locking flange closely fitting around the flanged rim of the tray and having gradually rounded corner portions matching the said rounded corner portions of said flanged rim, and the said locking flange being provided with a plurality of inwardly projecting locking rib means spaced therearound and engaged with the tray rim under the peripheral outer edge thereof to lock the dome lid in place on the tray, the improvement comprising: said locking rib means being located within the peripheral extent of respective ones of the said rounded corner portions of said locking flange, and said seating flange having an outwardly opening thumb notch recess in the outer peripheral edge thereof exposing a portion of the said tray rim through said recess, said thumb notch recess being spaced around the said seating flange a distance, from one of said locking rib means, such as to enable engagement through said thumb recess of the said flanged rim of the tray by the thumb of a person's hand while at the same time enabling engagement of the fingers of the person's same hand with the underside of the said locking flange of the dome lid, at a region outwardly adjacent the said one locking rib means, for application of a separating force couple directly and normal to the flanged rim of the tray and the said locking flange to disengage the said one locking rib means from the tray rim.

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CONTAINER WHICH IS A FORM OF PACKAGING IN PARTICULAR FOR MEDICAMENTS AND THE LIKE AND PROCESS FOR ITS MANUFACTURE

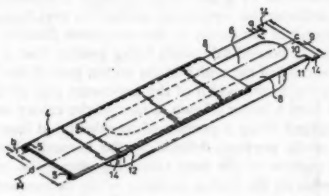
Aldo Artusi, Schaffhausen, Switzerland, assignor to Medipack AG, Schaffhausen, Switzerland

Continuation of Ser. No. 219,500, Dec. 23, 1980, abandoned. This application Apr. 21, 1983, Ser. No. 487,104

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1979, 2952616

Int. Cl.³ B65D *83/04, 85/42*

U.S. Cl. 206—530 9 Claims



1. A container comprising a receptacle part and a lid part, said receptacle part having a cavity for receiving stored contents in the container, said receptacle part and lid part including respective opposed portions one of which is in the form of a groove and the other of which is in the form of an edge portion slidably engaged in said groove to permit relative slidable movement of said lid part and receptacle part between open and closed positions, and displaceable flap means on one of said parts having a first position blocking relative movement of said lid and receptacle parts and a second displaced position in which relative slidable movement of said parts is permitted, said parts having longitudinal edges parallel to the direction of relative sliding movement of said parts and opposite transverse ends, said flap means comprising flaps located at both edges of each of said opposite ends to hold the lid part and receptacle part in said closed position, said one part being provided with

slits each forming a respective flap, each slit extending transversely from a longitudinal edge of said one part, each slit having a length at least equal to the depth of said groove, each of said flaps including stop means for holding the lid part and receptacle part in said closed position by blocking relative movement of said parts.

4,535,891

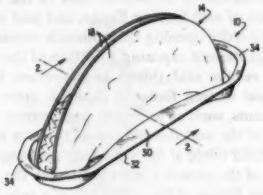
TACO TRAY

Brian K. Murdick, Columbus, and William H. Haase, Dublin, both of Ohio, assignors to International Paper Company, New York, N.Y.

Filed Aug. 23, 1983, Ser. No. 525,751

Int. Cl.³ B65D *1/34, 85/36*

U.S. Cl. 206—564 **1 Claim**



1. A tray and taco assembly for holding a taco in an upright position, said tray comprising a base, integral side and end walls extending upwardly from said base and in combination with said base defining an elongated cavity adapted to receive a taco, and a reinforcing flange extending around one top of said cavity and integrally connected to said top and end walls, the side walls being inwardly bowed so that longitudinally central portions thereof are narrowed with respect to the opposite longitudinal ends of said cavity to thereby form a support for a taco, the side walls diverging upwardly from said base for wedgingly receiving therebetween a taco, the side walls at the ends of the cavity being wider than the side walls at the longitudinally central part of the cavity, wherein said base is enlarged at ends thereof to provide a stable support against overturning of the tray when a taco is positioned in it, the end walls being rounded in outline, the reinforcing flange being generally rectangular in peripheral outline, the base being reinforced by a downwardly offset peripheral rib, said rib also defining the supporting surface for said base, the ratio of the length of the cavity to the narrowest distance between the inwardly bowed side walls being greater than a factor of three, the ratio of the width of the widest part of the base ends of the cavity to the width of the narrowest part of the cavity being at least a factor of two, a taco in the cavity and wedgingly engaged along a portion of its sides by at least the narrowest cavity portions defined by the inwardly bowed side walls, a portion of the taco extending above the top of the cavity, wherein the widest portions of the downwardly offset peripheral base rib, considered transversely of the longitudinal axis of the cavity, are wider than the widest portion of the taco, to thereby inhibit tipping over of the tray and taco assembly.

4,535,892

MODULARIZED TICKET HANDLING SYSTEM FOR USE IN AUTOMATIC TICKET PREPARATION SYSTEM

John B. Roes, San Diego; Guy M. Kelly, La Jolla; Robert F. Case, and Chandler R. Deming, both of San Diego, all of Calif., assignors to Cubic Western Data, San Diego, Calif.

Division of Ser. No. 211,022, Dec. 1, 1980, Pat. No. 4,381,705. This application Jan. 5, 1983, Ser. No. 455,756

The portion of the term of this patent subsequent to May 3, 2000, has been disclaimed.

Int. Cl.³ B07C *3/16*

U.S. Cl. 209—3.3 **9 Claims**

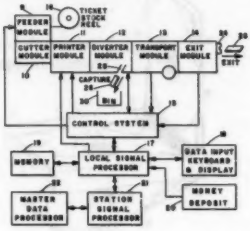
2. A ticket handling system for use in a ticket preparation system that includes processing means for providing write signals to indicate information to be encoded on said tickets; and transducer means for encoding information of tickets in response to said write signals, the ticket handling system comprising

a feeder module including feed means for feeding a strip of ticket stock;

a cutter module including cutting means for cutting ticket blanks of a given length from the fed end of the strip;

a transport module including the transducer means for encoding ticket information on the ticket blanks in response to said write signals; and

an exit module mechanically interfaced with the transport module and including means defining an exit passage for



passing said ticket from the transport module to an exit position where said ticket is accessible to a patron, sensing means for sensing the entry of an encoded ticket into the exit passage from the exit position toward the transport module, and bidirectional transport means for transporting said ticket in either direction through the exit passage; and

wherein the ticket handling system includes control means coupled to the sensing means and the transport means for causing said entered ticket to be transported into the transport module for encoding by the transducer means in response to the sensing means sensing said entry of said ticket into the exit passage from the exit position.

4,535,893

SPOOL SEPARATING DEVICE

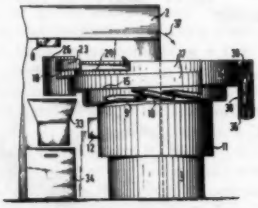
Heinz Bührea, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 19, 1984, Ser. No. 572,206

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301588

Int. Cl.³ B07C *5/06*

U.S. Cl. 209—628 **6 Claims**



1. Spool separating device for separating spool tubes with a relatively smaller diameter from finished wound spools with a relatively larger diameter, comprising a vibratory conveyor with a bottom, an upper end, a sliding surface extended spirally upward along a given spool transport direction from said bottom to said upper end, a wall outwardly bordering said

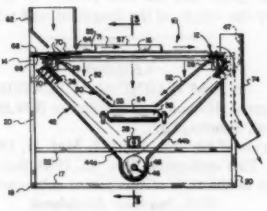
sliding surface, said wall having a slot formed at a given location therein, said slot having a height being greater than the diameter of a spool tube and smaller than the diameter of a finished wound spool and a length being greater than the length of a spool tube, an adjustable wall section in a position bordering the top of said slot determining the height of said slot, said adjustable wall section being resiliently moveable out of said position in the event of spool jamming, and an additional wall section determining the depth of said slot and approaching said bordering wall in said given spool transport direction for guiding the end of a spool tube of a spool which cannot fit completely through said slot back onto said sliding surface.

4,535,894

SEPARATOR APPARATUS FOR PEANUTS AND OTHER SEED CROPS

Melvin E. Shell, P.O. Box 1121, Stephenville, Tex. 76401

Filed Jan. 24, 1983, Ser. No. 460,248
Int. Cl.³ B07B *1/10*
U.S. Cl. 209—665 **18 Claims**



10. Separator apparatus for separating articles such as peanuts and like commodities from material such as vine stems and other debris commingled therewith, said apparatus comprising:

a frame;

means forming an endless flexible conveyor disposed on said frame for traversal with respect to said frame and including a substantially horizontal run, said horizontal run being divided into a primary separator portion and a secondary separator portion, said conveyor including means forming a screen defining a plurality of openings sized to permit said articles to fall through said horizontal run while said screen retains said material including stems and other debris of a length greater than said openings;

first hopper means disposed beneath said horizontal run for receiving articles separated from said material;

dispensing means for dispensing material including said articles to be separated onto each of said separator portions of said horizontal run; and

separate means for receiving material retained on said screen at the end of said primary and secondary separator portions, respectively.

4,535,895

SORTING DEVICE

Kiyoaki Takiguchi, Yokohama, and Seigo Takano, Tokyo, both of Japan, assignors to Computer Services Corporation, Tokyo, Japan

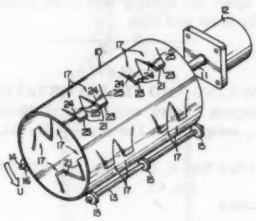
Filed Feb. 28, 1983, Ser. No. 470,720
Claims priority, application Japan, Apr. 13, 1982, 57-61308; Apr. 20, 1982, 57-66534; Apr. 24, 1982, 57-69213; Apr. 27, 1982, 57-70625; May 11, 1982, 57-79298; May 11, 1982, 57-79299
Int. Cl.³ B07C *1/10*; B07B *13/65*
U.S. Cl. 209—683 **6 Claims**

1. A device for sorting out a multiplicity of pieces according to their size, comprising:

a frame;

a drum rotatably mounted in said frame for storing therein pieces having different sizes to be sorted out, said drum having a clyindrical wall;

means on said drum including openings for passing therethrough pieces of a particular size only, said passing means comprising a plurality of rows of tapered tongues sheared off said cylindrical wall radially outwardly thereof and extending circumferentially of said cylindrical wall, each row of said tapered tongues extending axially of said drum, said tapered tongues terminating respectively in said openings and being progressively narrower toward said openings for guiding the pieces of a particular size



toward said opening, said tapering tongues further having an end edge and a pair of converging side edges extending from said cylindrical wall to said end edge, said end edge being displaced radially outwardly from said cylindrical wall to define therewith one of said openings and said passing means further includes guiding guide strips each extending along one of said said edges toward said opening to provide tapered guide passages respectively on said tapered tongues; and

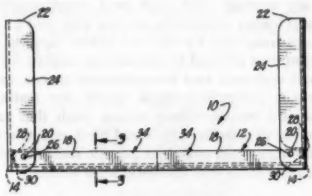
means for rotating said drum about its own axis to cause the pieces of a particular size to be discharged through said openings out of said drum.

4,535,896

FOLDING, EXTENSIBLE HOLDER

Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.

Filed Aug. 29, 1983, Ser. No. 527,331
Int. Cl.³ A47G *19/08*
U.S. Cl. 211—41 **6 Claims**



1. In a holder for use in supporting elongated, generally rectilinear, substantially flat objects, said holder having an elongated, generally rectangular base and upstanding ends located at opposed ends of said base, said upstanding ends being shaped so as to engage and support objects held in said holder in a vertical position the improvement which comprises:

said base being formed so as to include two separate sections, one of said sections being located adjacent to one of said upstanding ends, the other of said sections being located adjacent to the other of said upstanding ends,

interfitting tongue and groove means for adjustably connecting said sections located on said sections, said tongue and groove means on said sections being capable of being manipulated so as to vary the length of said base so as to

allow said holder to be utilized with objects of varying lengths,

co-acting detent means capable of being snapped apart located on said sections for holding said sections relative to one another in various positions such that the spacing between said upstanding ends approximately corresponds to standard lengths of various objects capable of being held in said holder,

said ends are pivotally mounted upon said sections and are capable of being pivoted between a flat folded position in which they extend along said position and a normal position in which they extend outwardly from said base, and

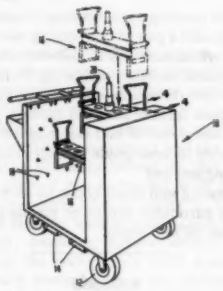
other co-acting resilient detent means capable of being snapped apart for holding said ends so that they extend outwardly from said base.

4,535,897

TOOL HANDLING AND TRANSPORTATION SYSTEM

John L. Remington, Coplay, and Harry W. Seidel, Mertztown, both of Pa., assignors to The Stanley Works, New Britain, Conn.

Filed Sep. 6, 1983, Ser. No. 529,728
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—70.6 **6 Claims**



1. An integrated tool storage and transportation system comprising a tool transportation means, a tool storage means, and an elongated tool holder member, in which said tool holder member is adapted for engagement for support by both said tool transportation means and said tool storage means, wherein said tool holder member comprises at its ends means adapted for mating with said tool transportation means, wherein said means adapted for mating with said tool transportation means comprised by said tool holder member at the ends thereof comprises pivoted handle means adapted for releasable engagement with said tool transportation means, said pivoted handle means comprising hook means for resting in slots formed in said transportation means, such that said handle means may be pivoted to move said hook means with respect to said slot means, in order to permit removal of said tool holder member from said transportation means.

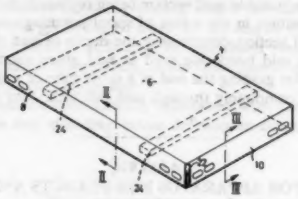
4,535,898

SHELVING

Harold Jones, Stafford, and David J. Bell, Telford, both of England, assignors to Link 51 Limited, England

Filed Feb. 22, 1983, Ser. No. 468,416
Claims priority, application United Kingdom, Feb. 27, 1982, 8205849
Int. Cl.³ A47F *5/00*
U.S. Cl. 211—153 **9 Claims**

1. In a shelf formed from sheet material and comprising a generally rectangular shelf panel and flanges integral with the panel which flanges extend from the panel along two parallel sides thereof, each flange comprising a first portion extending downwardly from the panel, a second portion folded inwardly so as to extend towards the underside of the shelf panel generally parallel to the first portion, the improvement wherein said second portion is spaced from said first portion, and on each of the said sides of the panel a non-integral reinforcing member is located between said first and second portions of the flange, which reinforcing member extends upwardly, and into engagement with, the underside of the shelf panel, an upper end of said reinforcing member extending in angular relationship to the upwardly extending portion thereof and being in juxtaposition with said underside of the shelf panel to support the corner between the panel and the first portion of the flange along substantially the whole of the length of said side.

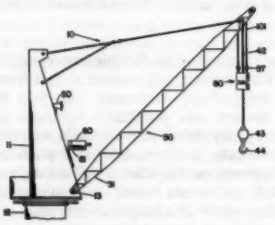


4,535,899

BOOM WARNING ACTUATOR

Ned A. Bergeron, Houma, La., assignor to B.W.B. Controls, Inc. (Louisiana), Houma, La.

Continuation of Ser. No. 266,112, May 21, 1981, Pat. No. 4,424,909. This application Dec. 12, 1983, Ser. No. 560,224
The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.
Int. Cl.³ B66D *1/56*
U.S. Cl. 212—153 **8 Claims**



1. A warning system for use on a crane wherein said crane includes a movable boom, and at least one movable weight bearing line, said system comprising:

a. a source of fluid under pressure;

b. a pressure activated signal emitting device;

c. a plurality of signal device actuators positioned in pressure communication with said source and device;

d. each of said actuators having a housing and a valve body mounted in said housing for longitudinal movement therein and shiftable between a first position permitting fluid pressure communication between said source and device and a second position blocking said communication, wherein one of said actuators further comprises:

i. a boom engageable portion of its valve body located outwardly of said housing;

ii. means internal to said housing for urging its valve body to said second position; and

iii. means for causing said boom engageable portion to shift said valve body to said first position against the force of said urging means; and wherein

e. a second of said actuators further comprises:

i. first and second body portions, each of said body por-

tions including means for passing said weight bearing line therethrough;

ii. fluid pressure inlet means provided in said first body portion in fluid pressure communication with a fluid pressure source;

iii. fluid pressure outlet means provided in said first body portion in fluid pressure communication with a fluid pressure activated signal emitter; and

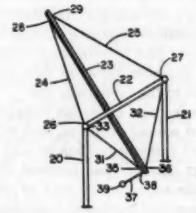
iv. an elongated valve member mounted at least partially in said first body portion for longitudinal movement therein between a first position permitting pressure communication between said inlet and outlet and a second position blocking such communication.

4,535,900

TRANSFER APPARATUS AND METHOD

Alan F. Daniell, Stafford, Tex., assignor to Fluor Corporation, Irvine, Calif.

Filed Apr. 25, 1983, Ser. No. 488,240
Int. Cl.³ B66C *23/00*
U.S. Cl. 212—193 **16 Claims**



1. A transfer apparatus comprising:

elevated support means,

a boom,

at least two ropes extending between the support means and at least first and second longitudinally spaced points on the boom,

at least two ropes extending between at least third and fourth longitudinally spaced points on the boom and anchor means spaced horizontally from said third and fourth points,

at least one rope extending between a fifth point on the boom and anchor means spaced vertically from said fifth point,

said boom being substantially completely suspended by said ropes and said ropes being arranged such that the elevation and axial movement of said boom being controlled by at least said ropes extending between said support means and said boom, slewing of said boom in the horizontal plane and luffing of said boom in the vertical plane being controlled by at least said ropes extending between said boom and said anchor means, and

means for individually and simultaneously varying the length of all said ropes to enable the boom to move in the three perpendicular planes of the universe.

4,535,901

BLOW-MOLDED MULTI-PLY VESSEL

Tadashi Okudaira; Akio Tsuboi; Yoshihisa Hama, and Mamoru Hara, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Jan. 21, 1982, Ser. No. 341,425
Claims priority, application Japan, Jan. 22, 1981, 56-8729; Feb. 3, 1981, 56-15182
Int. Cl.³ B65D *23/00*; B32B *27/00*
U.S. Cl. 215—1 C **6 Claims**

1. A blow-molded multi-ply vessel having an open end mouth part and a thin wall part, which comprises:

a multi-ply structure of three or more odd-numbered layers at least at the thin wall part;

two or more kinds of thermoplastic resins, at least one of which being a thermoplastic polyester resin mainly composed of the repeating units of ethylene terephthalate;

the innermost and the outermost layers of said multi-ply structure being composed of said thermoplastic polyester resin;

at least one of the middle layers of said multi-ply structure being composed of a thermoplastic resin the main component of which is a resin selected from the group consisting of a polyamide resin, a polymer having a high nitrile content, an ethylene/vinyl alcohol copolymer, a polyolefin resin, a polyacrylic resin, a polyvinyl chloride resin, a polycarbonate resin and a polystyrene resin;

said innermost and outermost layers extending over the entire inside and outside surfaces of said vessel and being integrated at least at the open end mouth part to form a single layer structure of said thermoplastic polyester resin to wrap the middle layers; and

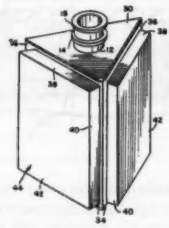
at least the thin wall part being biaxially oriented.

4,535,902

INTERMEDIATE ARTICLE OF MANUFACTURE FOR A PLASTIC CONTAINER

Richard E. Clark, Merrimack, N.H., assignor to Continental Packaging Company, Inc., Stamford, Conn.

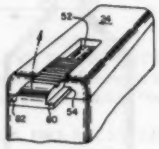
Continuation-in-part of Ser. No. 364,563, Apr. 1, 1982,. This application Sep. 24, 1982, Ser. No. 423,358
Int. Cl.³ B65D *1/22*; B29D *23/03*; B29C *17/08*
U.S. Cl. 215—1 C **7 Claims**



1. An intermediate article of manufacture conprising a blow molded hollow shape formed of an orientable plastic material and having top and bottom walls joined by a plurality of sides in excess of two, a hollow neck extending from said top wall, and each of said sides having extending therefrom a projection, each projection being in the form of a container including a bottom wall and a side wall arrangement, said side wall arrangement including an edge remote from said container bot-

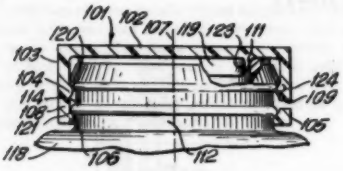
tom side wall and integrally joined to the respective one of said sides.

4,535,903
CHILD PROOF MEDICINE VIAL
Roberto D. Franchi, 167 Pequot Tr., Stonington, Conn. 06378
Filed Apr. 27, 1984, Ser. No. 604,663
Int. Cl.³ B65D 55/02
U.S. Cl. 215—213 7 Claims



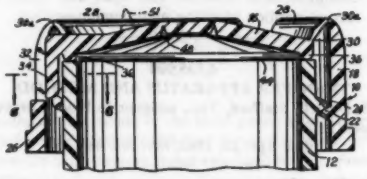
1. A medicine container comprising:
side walls and end walls having rounded corners;
a bead extending circumferentially of the inside of said walls near the open end thereof;
a cap having a top surface interrupted by a recess having a vertical surface therein and having a depending flange with a groove therein for mating with said bead;
an integral hinge between the container and the cap; and
a slidable panel in the recess in the cap, said panel having a raised boss with a rear vertical wall which abuts said vertical surface thus checking inward movement of the slidable panel.

4,535,904
TOOL REMOVABLE TAMPER INDICATING CLOSURE
Michael C. O'Connor, South Windsor, and George W. Hann, East Hartford, both of Conn., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Dec. 11, 1984, Ser. No. 680,571
Int. Cl.³ B65D 55/02
U.S. Cl. 215—215 39 Claims



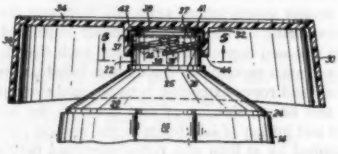
1. A tamper-indicating closure comprising a disc-shaped top with an upper skirt extending downwardly from the top; an annular upper locking bead around the inner surface of the upper skirt; a lower skirt proximate to and in center alignment with the upper skirt, the upper skirt being disposed between the top and the lower skirt; an annular retention bead around the inner surface of the lower skirt; breakable bridge means between the upper skirt and the lower skirt as the sole connection between the upper and lower skirt; and a tool aperture between the upper skirt and the lower skirt adapted to accept a tool means for breaking the bridge means so as to part the upper and lower skirts.

4,535,905
CLOSURE
Jeffrey Sandhaus, Rte. 9W, Snedens Landing, N.Y. 10964
Continuation of Ser. No. 441,546, Nov. 15, 1982, Pat. No. 4,479,585, which is a continuation-in-part of Ser. No. 399,237, Jul. 19, 1982, Pat. No. 4,442,945, which is a continuation-in-part of Ser. No. 335,216, Dec. 28, 1981, Pat. No. 4,413,742. This application Sep. 26, 1984, Ser. No. 654,856
Int. Cl.³ B65D 55/02
U.S. Cl. 215—218 8 Claims



1. In a closure adapted to be fastened onto a container, said closure including a top and skirt, the improvement comprising:
at least one container engaging portion of said closure forming an integral part thereof, said container engaging portion being movable between first and second positions with respect to the container; and
means for moving said container engaging portion between said first and second positions, said moving means including a flexible resilient portion of said closure forming an integral part thereof, said resilient closure portion itself being flexible such that flexure of said resilient closure portion causes said container engaging closure portion to move between said first and second positions to coact with at least one surface of the container.

4,535,906
BOTTLE
Patricia A. Rowekamp, Cincinnati, Ohio, assignor to The Drackett Company, Cincinatti, Ohio
Filed Jun. 1, 1984, Ser. No. 615,972
Int. Cl.³ B65D 51/18
U.S. Cl. 215—329 18 Claims



1. A container having an overcap, which container is adapted for closure by rotatable attachment of the overcap through a quarter-turn, the container comprising an ovate container body having a centrally disposed neck, the neck having a pair of discontinuous threads describing, in opposed quadrants, arcs of about 90°, and a removable overcap having a planar top surface and an exterior ovate skirt and having a cap member extending downwardly from said planar top surface, said cap member being provided with a pair of discontinuous threads adapted for engagement with the threads provided on the neck, whereby the container is closed by placement of the cap member on the neck as to provide engagement of the terminal ends of the threads of the neck and of the cap member and rotating the overcap one quarter-turn, the ovate exterior skirt being brought into substantial alignment with the ovate container body thereby.

4,535,907

CATHODE-RAY TUBE

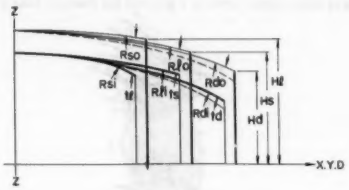
Kiyoshi Tokita, Fukaya; Toshinao Sone, Kumagaya, and Michio Nakamura, Fukaya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1984, Ser. No. 586,147

Claims priority, application Japan, Mar. 9, 1983, 58-37435; Mar. 9, 1983, 58-37436

Int. Cl.³ H01J *61/30*

U.S. Cl. 220—2.1 A 4 Claims



1. A cathode-ray tube comprising:

a glass panel section constituting a glass envelope having a tube axis, said glass panel section including a substantially rectangular faceplate, whose inner and outer surfaces are curved, and a skirt extending from a peripheral portion of said faceplate along the tube axis, wherein when ts, tl and td respectively denote thickness of said faceplate in the vicinity of the center portion of the short side, that in the vicinity of the center portion of the long side and that in the vicinity of the corner, and Hs, Hl and Hd respectively represent length of the skirt at the center portion of the short side, that at the center portion of the long side and that at the corner as the length of each of them is measured between the outer surface of said faceplate and the end portion of said skirt along the tube axis, then, the thickness of said faceplate and the length of said skirt have relations defined by the following equations of inequalities (1) and (2):

$$Hs \geq Hd \text{ and } Hl \geq Hd \quad (1),$$

$$tl \geq ts \text{ and } td \geq ts \quad (2).$$

4,535,908

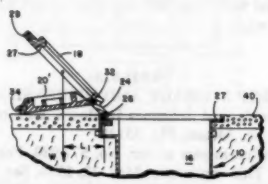
DOUBLE HINGE COUNTER-WEIGHT COVER ASSEMBLY

Robert M. Dabich, 7212 Patterson Dr., Garden Grove, Calif. 92640

Continuation-in-part of Ser. No. 538,187, Oct. 3, 1983, Pat. No. 4,467,932. This application Aug. 27, 1984, Ser. No. 644,875

Int. Cl.³ B65D *25/24*

U.S. Cl. 220—18 15 Claims



1. A lid assembly for a subsurface chamber comprising a support for covering the top of a subsurface chamber, a first access lid, first hinge means mounting said first access lid on said support for rotational movement about an axis of rotation between closed and open positions, a second, smaller access lid, second hinge means mounting said second lid on said first lid for rotational movement through an obtuse angle when said first lid is in a closed position such that the center of gravity of said second lid passes across the axis of rotation of said first access lid as said lid moves between closed and open positions.

4,535,909

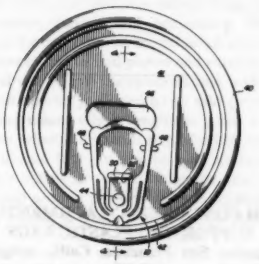
EASY OPENING CONTAINER SYSTEM

Edgar H. Zysset, St. Cloud, Fla., assignor to Automated Container Corporation, Orlando, Fla.

Filed Mar. 23, 1984, Ser. No. 592,831

Int. Cl.³ B65D *17/36*

U.S. Cl. 220—273 21 Claims



1. A container having a pull tab for the easy opening thereof, said container comprising:

a container having an end with a weakened score line the severing of which permits access to said container;

a fastener joined to said container end and spaced from said score line;

a pull tab joined to said fastener and having a pull ring extending from said fastener in a direction away from said score line and a nose portion extending adjacent said score line, said tab further including a pair of beams, each beam extending from said pull ring to said nose portion;

means for strengthening each of said beams continuously along the length from said pull ring to said nose portion; and

first and second carrier lug cutouts spaced along the rearward portion of said pull ring, with a lifting portion between said carrier lugs and with a peripheral curl along said lifting portion.

4,535,910

TANK CAP FOR POWERED MACHINE

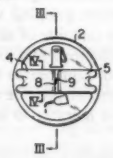
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,378

Claims priority, application Japan, Aug. 30, 1983, 58-133121[U]

Int. Cl.³ B65D *51/00*

U.S. Cl. 220—377 2 Claims



1. A tank cap for closing the filling port of a tank mounted on a power-driven machine having an internal combustion engine, said tank containing a fuel to be supplied to said engine

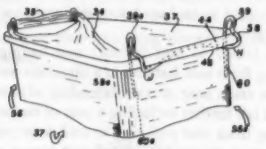
or lubricating oil, wherein the improvement comprises that said tank cap is made of a transparent plastic material and has a protrusion protruding outwardly from the main surface of said cap, said protrusion defining therein a cavity communicating with the interior of said filling port of said tank such as to allow said fuel or lubricating oil to enter said cavity, and wherein said protrusion is constituted by two parts extending along a common diametrical line of the main surface of said tank cap and separated from each other by end walls defining radially inner ends of said parts of the protrusion, said end walls being made integral with the cap so as to constitute a central stiffening wall.

4,535,911

TRASH CONTAINER ATTACHMENTS FOR SUPPORTING PLASTIC BAGS

Victor H. Goulter, San Francisco, Calif., assignor to David Pressman, San Francisco, Calif., a part interest

Filed May 7, 1984, Ser. No. 607,797
Int. Cl.³ B65D *90/04*
U.S. Cl. 220—404 **19 Claims**



1. For a trash container having an open mouth at its top and a rim around said open mouth, an attachment for holding a plastic bag having handles in an open condition within said container by hanging said handles from the top of said container at opposite sides thereof, said attachment comprising:

(a) support means which can be removably attached to said rim at the top of said container without altering said container,

(b) said support means comprising a pair of members which provide at least two upstanding portions which extend up from said rim above said container at said respective opposite sides of said container,

(c) said upstanding portions being shaped to hold said handles of said bag at said respective opposite sides of said container and to suspend said bag within said container by said handles,

(d) each of said pair of members being bent into a configuration which provides grasping means for holding each member rigidly to one side of said container such that:

(1) respective portions of said member are positioned on opposite sides of said rim so that said respective portions of said member provide a sufficient grasp of said rim to hold said member to said rim without altering said rim,

(2) each of said members can be removed from said rim by simply withdrawing said respective portions thereof from said rim, and

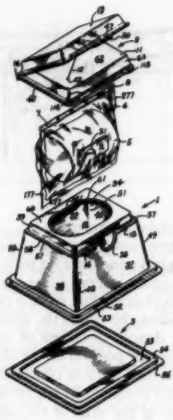
(3) said upstanding portions of said support means extend up from said respective members at the respective sides of said container.

4,535,912

PRE-MOISTENED TOWELETTE DISPENSER

Joseph P. Bonk, Des Plaines, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 858,214, Dec. 7, 1977, abandoned, which is a continuation of Ser. No. 680,607, Apr. 26, 1976, Pat. No. 4,101,026, which is a division of Ser. No. 405,503, Oct. 11, 1973, Pat. No. 3,986,479. This application Jan. 7, 1980, Ser. No. 109,757
Int. Cl.³ A47K *10/38*
U.S. Cl. 221—46 **10 Claims**



10. In a pre-moistened towelette dispenser assembly having a body portion defining a cavity for receiving a towelette roll comprising a web: (i) having a first and a second parallel side edge, (ii) having individual towelettes defined in said web by spaced lines of perforations transverse to the web, and (iii) being of absorbent material containing a fluid impregnated therein, and a generally planar top portion having a slit therein for withdrawing said roll material from said cavity through said slit, the improvement which comprises:

(a) said body portion adapted with at least one inclined side wall forming a juncture with said slit-containing top portion;

(b) said slit is substantially the width of said web roll and is disposed at an angle oblique to said juncture; and

(c) said perforation lines in said roll being substantially parallel to said juncture so that upon feed of said towelette material through said slit, said slit is disposed at an oblique angle to said perforations and pull on a first towelette projecting through said slit at an angle to the web as it is unrolled from said roll automatically initiates a tearing separation by action of said slit itself of said first towelette from said web from said first edge across said web to said second edge.

4,535,913

GAME CHIP STORAGE AND DISPENSING DEVICE

David W. Hooie, and Johannes Daldosch, both of Box 29, 730 NW. 90th St., Miami, Fla. 33138

Continuation-in-part of Ser. No. 577,980, Feb. 8, 1984, abandoned. This application Mar. 22, 1984, Ser. No. 592,451
Int. Cl.³ B65G *59/00*
U.S. Cl. 221—251 **9 Claims**

6. In a game chip storage and dispensing device having:

a sleeve adapted to extend upright for holding a stack of chips, and means for urging the chips downward along said sleeve;

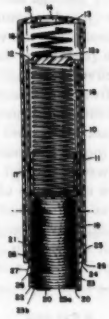
the improvement which comprises:

first and second sets of flexible and resilient fingers extending

down from said sleeve at circumferentially spaced locations thereon;

each finger of said first set having a lateral protrusion extending inward for engagement beneath the lowermost chip in the stack, each finger of said first set having a normal unstressed position permitting downward movement of the chips past said lateral protrusion;

each finger of said second set having a lateral protrusion extending inward for engagement beneath a chip in the stack and located higher than the protrusions on the fingers of said first set by substantially the thickness of one chip, each finger of said second set having a normal unstressed position



permitting downward movement of the chips past its lateral protrusion;

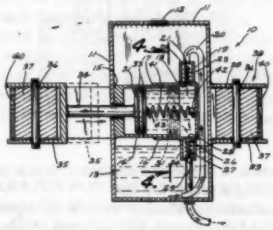
and operating means for: (a) forcing the fingers of said first set toward the stack of chips to position said protrusions thereon beneath the lowermost chip in the stack while permitting the fingers of said second set to assume their normal unstressed position; and (b) permitting the fingers of said first set to assume their normal unstressed positions to enable said lowermost chip to drop from the stack while forcing the fingers of said second set toward the stack of chips to position their protrusions beneath the next chip immediately above the chip which drops from the stack.

4,535,914

AUTOMATIC LARVICIDE DISPENSER

Raymond J. A. Coty, P.O. Box 1954, New Britain, Conn. 06050

Filed Feb. 21, 1984, Ser. No. 581,790
Int. Cl.³ B67D *5/08*
U.S. Cl. 222—52 **5 Claims**



1. An automatic larvicide pump dispenser comprising:

container means for holding liquid larvicide;

a discharge port connected to said container means;

a sealed cylinder disposed within said container;

a piston reciprocally disposed within said cylinder and being sealed at the edges thereof against the inside of said cylinder, said piston being movable between a first and second reciprocal position within said cylinder;

means for biasing said piston to a first position within said cylinder;

first conduit means for communicating the supply of liquid larvicide in said container means with said cylinder;

a first one-way valve means disposed within said first conduit means for permitting flow of liquid to flow from the container means to said cylinder when said piston is moved from the second position to the first position thereof, and preventing flow through said first conduit means at all other times;

second conduit means for communicating the inside of said cylinder with said discharge port;

a second one-way valve means disposed in said second conduit means for permitting flow from said cylinder to said discharge port when said piston is moved from the first to the second position thereof and preventing flow of liquid through said second conduit means at all other times;

a piston rod connected to said piston and extending out of said cylinder and out of said container means; and

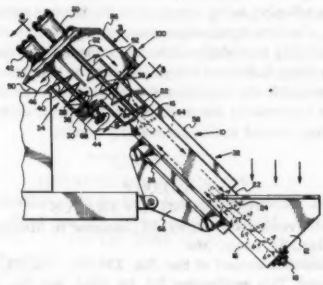
actuator means operably connected to said piston rod and to said container means which lengthens when it becomes wet and shortens when it becomes dry whereby said piston will be pushed to said first position by said biasing means when said actuator means is wet and whereby said piston will be pushed to said second position thereof, against the force of the biasing means, as said actuator means becomes dry.

4,535,915

DELIVERY AND METERING DEVICE FOR GRANULATED AND POWDERED MATERIALS

Joe E. West, Coppell, Tex., assignor to The Western Company of North America, Forth Worth, Tex.

Filed Jul. 22, 1983, Ser. No. 516,378
Int. Cl.³ G01F *11/20*
U.S. Cl. 222—56 **15 Claims**



1. A device for delivering and metering a flow of granulated or powdered material from a collection facility to a processing stage, said device comprising:

a first metering screw;

a second metering screw parallel to and intermeshed with said first metering screw, said first and second metering screws having identical pitch and orientation;

means for driving said first and second metering screws in synchronous rotation;

means for controlling the speed at which the first and second metering screws are driven;

a metering screw housing surrounding both the first and second metering screw;

a metering inlet of said metering screw housing;

a delivery outlet of said metering screw housing having a lowest elevation at substantially the same elevation as the highest elevation of the inlet to said metering screw, said delivery outlet being disposed to pass the flow of the granulated or powdered material to the processing stage; and

means for presenting a continuous flow of the granulated or

powdered material from said collection facility to said metering inlet; and

means for separating a portion of the flow of the granulated or powdered material not entering said metering inlet from the means for presenting a continuous flow.

4,535,916

GLUE GUN

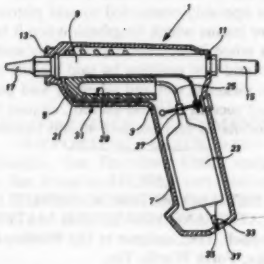
Günter Mächerle, Kandel/Pfalz, and Ludwig Lieber, Steinweiler, both of Fed. Rep. of Germany, assignors to Fritz Eichenauer, Pfalz, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,616

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213547

Int. Cl.³ B67D 5/66

U.S. Cl. 222—113 **9 Claims**



1. A glue gun for conducting adhesive bonding by means of a heated adhesive, comprising a housing having a heat section and an angled handle, a hollow metal block which accommodates the adhesive being arranged in the heating section of the housing, a hollow combustion chamber equipped with air inlet openings being provided within said housing, said combustion chamber being fashioned integrally with the metal block; a fuel tank arranged in the handle; and a connecting conduit extending from the tank to the combustion chamber, a shutoff element being located in this connecting conduit.

4,535,917

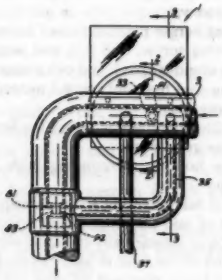
DISPENSING APPARATUS

Joseph M. Trewhella, Godfrey, Ill., assignor to Multiplex Company, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 234,350, Feb. 13, 1981, abandoned. This application Jul. 16, 1982, Ser. No. 399,197

Int. Cl.³ B67D 5/56

U.S. Cl. 222—129.1 **10 Claims**



1. Apparatus for dispensing cold drinks comprising:

a line for supplying cold water for drinks adapted for continuous flow of water therethrough;

a valve for dispensing water from said supply line, said valve comprising a valve body having an inlet interconnected with said line at a first point along said line, an outlet for delivery of water from the valve body into a cup, a delivery passage in the body for delivery of water from the inlet to the outlet, a valve seat in the body adjacent the outlet, and a valve member associated with the body movable between a closed position engaging the seat blocking flow of water through the outlet and an open position for flow of water through the outlet; and

a system for maintaining a continuous flow of the cold water through said delivery passage and back to said line when the valve member is closed to assure having cold water on tap for being dispensed when the valve member is opened, comprising a return passage in the valve body interconnected with the delivery passage downstream from the inlet and upstream from but adjacent the valve seat and a return connection from said return passage to said supply line at a second point along said line downstream from said first point, and means for causing a pressure differential in the water between said first and second points such that, when the valve member is closed, cold water flows continuously from said first point along said line to the inlet, through said delivery passage, through said return passage and through said return connection back to the line at said second point along said line.

4,535,918

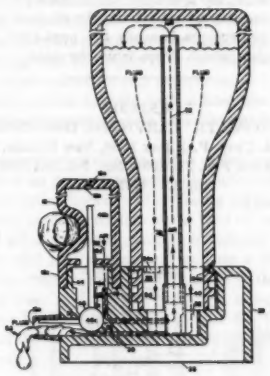
DISPENSER WITH SQUEEZE-BULB ACTUATOR

Randy B. Heiligman, 10411 S. Cedar Lake Rd., Minnetonka, Minn. 55343, and Paul Keller, 9404 NW. East River Rd., Coon Rapids, Minn. 55433

Filed Jun. 3, 1983, Ser. No. 500,765

Int. Cl.³ B67D 5/00

U.S. Cl. 222—185 **9 Claims**



1. In combination, a bottle and dispenser, bottle including:

a. bottle including a screw top lip;

b. dispenser including a housing with an air input channel, and a liquid output channel, said air input channel running downward from an upper portion of the housing, through said housing, into a tube extending upward, a bottle receiving hole surrounding said tube, a liquid dispensing chamber running from said bottle receiving hole to a spout; and,

c. a squeeze air bulb connected to said air input chamber and encompassing a portion of said bottle, and a lever positioned in said liquid dispensing channel within said spout, and in said squeeze bulb whereby squeezing said squeeze

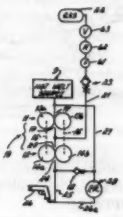
bulb pivots said lever in said spout to allow for passage of fluid.

4,535,919

HOT MELT ADHESIVE SYSTEM

Calvin R. Jameson, Atlanta, Ga., assignor to Nordson Corporation, Amherst, Ohio

Filed Aug. 19, 1981, Ser. No. 294,191
Int. Cl.³ F04C *15/04*
U.S. Cl. 222—190 **20 Claims**



1. Apparatus for dispensing a foamed adhesive or sealant material, said apparatus comprising,

a pump,

means for supplying said material in a liquid state to said pump,

a source of gas,

means for supplying gas from said source to said pump such that said pump is operable to agitate said liquid material in the presence of the gas so as to distribute said gas throughout said liquid material and to pressurize said liquid material and gas to place said gas into solution with the liquid material,

means for dispensing said liquid material and gas solution at a pressure below the solution maintenance pressure of said liquid material and gas solution whereby the gas is released from solution as said liquid forms a foam,

first fluid conduit means for supplying said liquid material and gas solution from said pump to said dispensing means,

second fluid conduit means for recycling said liquid material and gas solution from said dispensing means back to said pump,

third fluid conduit means including a spring biased pressure relief valve means for interconnecting said first and second fluid conduit means, and

a spring biased pressure regulator contained within said second fluid conduit means for maintaining a substantially constant back pressure of liquid material and gas solution within said dispensing means, and

said pressure regulator including a variable orifice and means including a fixed orifice restrictor responsive to changes in flow and changes in the viscosity of liquid material and gas solution flowing through said pressure regulator to vary the size of said variable orifice.

4,535,920

APPARATUS FOR APPLYING LAP SEALANT

Leon M. Troup, 601 Hampton St., Marquette, Mich. 49855

Filed Sep. 30, 1983, Ser. No. 537,842
Int. Cl.³ B67D *5/00, 3/00*
U.S. Cl. 222—612 **8 Claims**

1. An apparatus for applying a strip of material along a selected work path comprising

frame means having a pair of wheels;

said frame means having rear handle means for permitting an operator to move said frame means;

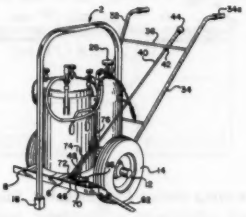
tank means for retaining a supply of material to be applied;

conduit means coupled to said tank means and having a nozzle mounted thereon at a position outboard of one of said wheels;

said nozzle having an upper end portion being pivotally mounted on said conduit means generally about a horizontal axis, said nozzle being pivotally mounted between an upper position and a lower dispensing position;

said nozzle being mounted to assume a material applying position outboard of one of said wheels and to apply a generally continuous strip of material along the work path as the frame means is rolled adjacent the work path;

said nozzle having a lower delivery edge defining a nozzle opening, and said nozzle being free to pivot with respect to said frame means whereby said nozzle lower delivery edge floats on the material being applied when said nozzle is in the lower dispensing position;



valve means connected to said conduit means operative between an open position allowing delivery of material from said supply means to said nozzle and a closed position closing delivery;

a valve control lever connecting said valve means to said handle means for controlling operation of said valve means in either open or closed position;

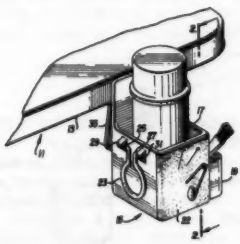
said nozzle is pivotally mounted for pivotal movement between a lower position corresponding to said material applying position and a raised position, said control lever further coupled to said nozzle for simultaneously causing said valve means to assume said open position and said nozzle means to assume said lowered position.

4,535,921

IRONING BOARD CADDY

Mildred P. Sanders, 304 Melrose Dr., Jackson, Miss. 39211

Filed Apr. 17, 1984, Ser. No. 601,201
Int. Cl.³ D06F *81/10*
U.S. Cl. 223—106 **13 Claims**



1. A caddy for attachment to an ironing board having a downwardly extending peripheral flange with an inwardly extending lip, said caddy comprising

at least one substantially rigid compartment open at its upper end;

a substantially flat wall forming part of, and extending upwardly from said compartment for abutting the outer face of said flange; and

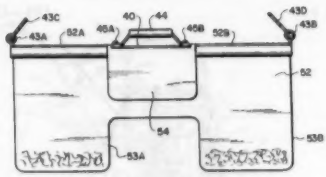
a spring biased clip pivotally secured to the outer face of said wall with its upper end opposite said upwardly extending wall for abutting the inner face of said flange whereby said upwardly extending wall and clip, when secured to said flange, support said caddy below the edge of said ironing board.

4,535,922

TRAP STAND CARRIER

Bart M Yarnold, 6425 Reseda Blvd., Reseda, Calif. 91335

Filed Apr. 5, 1984, Ser. No. 597,406
Int. Cl.³ B65D *71/00*; G10G *7/00*
U.S. Cl. 224—202 **3 Claims**



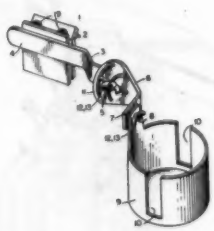
1. A carrying device for elongated, folded musical instrument stands comprising an elongated main brace; a handle; adjustable, centraly-located means on said elongated main brace for attaching said handle to said main brace; means along said main brace for holding corresponding portions or said stands tightly against said main brace comprising a continuous piece of flexible material extending from one end of said main brace to the other end in length, with one side secured along the top of said main brace; the other side of said flexible material, away from said main brace, including elongated flaps at either end to wrap around said top of said main bace on either side of said handles, and means for securing said elongated flaps on the other sides of said flexible material along the top of said main brace; the width of said material, including said elongated flaps being sufficient to wrap completely around any of said stands being carried by said device.

4,535,923

AUTOMOBILE BEVERAGE HOLDING DEVICE

James E. Manke, P.O. Box 64295, West Los Angeles, Calif. 90064

Filed Mar. 25, 1983, Ser. No. 478,678
Int. Cl.³ B60R *7/00*
U.S. Cl. 224—273 **7 Claims**



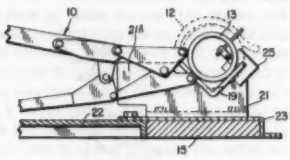
1. An automobile beverage holding device comprising, a spring biased clip member for securing said device to a support member such as an ash tray or glove compartment, a shank member attached at one end to said clip member and having an adjustable slot assembly at the other end thereof, and a receptacle, adjustably connected to said adjustable slot assembly, for holding a beverage container in a secure and upright orientation.

4,535,924

APPARATUS FOR SUPPORTING A PIPE AND PIPE SNAPPING TOOL

Harold F. Quinn, 8003-13th Ave. South, Bloomington, Minn. 55420

Filed Apr. 20, 1984, Ser. No. 602,436
Int. Cl.³ B26F *3/00*
U.S. Cl. 225—104 **6 Claims**



1. A support for supporting a pipe to be cut and a pipe snapping tool having a pair of handles and a pair of actuator jaws, the support comprising:

base support means for supporting a pipe to be cut and the jaws of a pipe snapping tool, comprising elongated main support means and a pair of upwardly opening pipe trays fixedly attached to the main support means and aligned with each other along the longitudinal axis of the main support means, said pipe trays being separated from each other by a predetermined space adjacent the center of the main support means to create a support gap over which the pipe to be cut lies when supported on the pipe trays;

wall support means attached to the ends of each pipe tray at opposite sides of the support gap and extending perpendicular to the longitudinal axis of the pipe trays, and facing each other across the support gap, the wall support means spacing the pipe trays on the main support such that the lower jaw of a pipe snapping tool may be positioned between the wall support means, and will lie below a pipe spanning the support gap when supported by the pipe trays; and

lateral support means releasably attached to and disposed laterally of an substantially perpendicular to the main support means, and being centered between the wall support means, to provide a laterally extending base for one handle of a pipe snapping tool positioned between the wall support means.

4,535,925

SEMI-AUTOMATIC PNEUMATIC EXPANSION RIVET GUN

Carl Ramey, Yellville; Royce W. Hill, Flippin, and James H. Beljen, Mountain Home, all of Ark., assignors to Micro Plastics, Inc., Flippin, Ark.

Filed Aug. 10, 1983, Ser. No. 521,931
Int. Cl.³ B21J *15/02*
U.S. Cl. 227—55 **11 Claims**

1. A pneumatic, semi-automatic, hand-held rivet applicator gun comprising:

rigid pistol grip means adapted to be gripped by a user for operating the gun;

magazine means for storing a plurality of rivets and for serially feeding them for subsequent application by said gun;

barrel means for serially receiving rivets from said magazine means, said barrel means having an internal chamber defined therein, said chamber including ram means and piston means axially displaceable therewithin for periodically forcibly dispensing rivets from said barrel means;

said ram means including internal, substantially coaxially aligned plunger means adapted to be forcibly contacted by said piston means for installing a rivet;

intermediate pneumatic means for actuating said barrel means; and,

trigger actuated pneumatic control means adapted to be coupled to an external pneumatic source for actuating said intermediate pneumatic control means in response to manual operation of a trigger associated with said grip means;

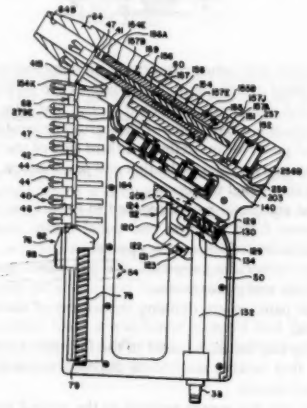
said trigger actuated pneumatic control means including a trigger valve chamber having a plurality of ports and a trigger valve disposed for axial movement therewithin;

said intermediate pneumatic means including an intermediate chamber, first and second axially aligned intermediate valves confined within said chamber for axial movement in response to pneumatic signals derived from said trigger actuated pneumatic control means, and a plurality of pneumatic input and output ports;

said pneumatic barrel chamber including a plurality of inlet ports in fluid flow communication with said intermediate pneumatic switch output ports;

said trigger valve being configured to establish, when in a rest position relative to said trigger valve chamber ports, a pneumatic path flowing to said intermediate chamber to bias said first said second intermediate valves to a rest position; and,

said second intermediate valve, when in a rest position, being



configured to establish a pneumatic path through preselected output ports in said intermediate chamber in fluid flow communication with preselected ones of said barrel chamber inlet ports to effectuate biasing of the piston means to a rest position and biasing of said ram means to a loaded rest and ready position.

7. A method of serially installing plastic expansion rivets comprising the steps of:

providing a gun-like frame adapted to be held by the hand of an operator with a magazine for storing rivets to be applied and for automatically feeding them to a feed position;

pneumatically controlling and initiating operation of said gun with a trigger-operated pneumatic trigger control valve operatively coupled to a source of high pressure air;

loading said rivets within an axially displaceable ram disposed within a generally tubular barrel;

forcibly discharging said rivets from said ram and said gun by forcibly contacting a plunger coaxially, slidably disposed within the ram by a piston axially slidable within the barrel independent of said ram;

controlling pneumatic operation of said ram and said piston with an intermediate pneumatic control valve system operated by said trigger operated pneumatic control valve by generating a plurality of pneumatic control signals with first and second independent intermediate spool valves disposed within adjacent intermediate pneumatic chambers,

said controlling step including the steps of:

first said piston in response to actuation of said trigger valve by simultaneously moving both said first and second intermediate valves to a fire position in response to said trigger valve whereby to activate said piston; and,

returning said piston to a rest state and recycling and thus recocking said ram in response to release of said trigger valve.

4,535,926

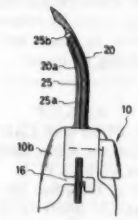
FASTENER DISPENSING DEVICE

Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan and Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Nov. 30, 1983, Ser. No. 556,752

Int. Cl.³ B25C *1/00*

U.S. Cl. 227—67 **6 Claims**



1. A fastener dispensing device for applying individual tag pins from an assembly, each tag pin having a head section and a crossbar joined together by a filament, comprising a main body having a grip portion and a nose portion, an operation lever pivotably supported on said grip portion of said main body, a side-slitted hollow needle supported on said nose portion of said main body, said hollow needle being curved such that said side-slitted portion of said hollow needle lies along the inside surface of said curve, and a driver supported in said main body operatively coupled to said operation lever and adapted to reciprocate through said hollow needle as said operation lever is squeezed and released, said driver having a top end portion which abuts against successive crossbars of said tag pins in said assembly to push said crossbars through said hollow needle as said driver is reciprocated, said driver including a flexible stem portion at least along a portion of its length to permit said top end portion of said driver to travel in said curved hollow needle to press successive crossbars therethrough.

4,535,927

WORKPIECE PRESET JIG ARRANGEMENT IN A WELDING APPARATUS

Soichi Matsubara, Oura; Hirobumi Morita, Shiki, and Shinpei Watanabe, Hidaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1983, Ser. No. 500,826

Claims priority, application Japan, Jun. 4, 1982, 57-94784; Jun. 5, 1982, 57-96801; Jun. 7, 1982, 57-96315; Jun. 7, 1982, 57-93423[U]

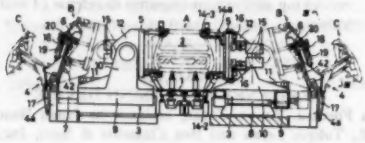
Int. Cl.³ B23K *9/32*

U.S. Cl. 228—6.1 **15 Claims**

1. A workpiece preset jig arrangement in a welding apparatus having a welding apparatus body, welding jig means on said welding apparatus body, and clamp means on said welding jig means for clamping plural component parts for constituting a workpiece to be welded to another workpiece, and means on

said welding jig means for welding said constituted workpiece to said other workpiece, said arrangement comprising:

preset arrangement body means positioned adjacent said welding apparatus body for movement relative thereto, preset jig means provided on said preset arrangement body means for presetting of said plural component parts, and preset clamp means on said preset jig means for clamping said plural component parts, said preset jig



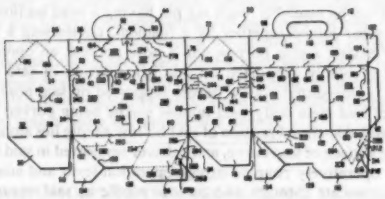
means being movable between a set position facing said welding jig means and a preset position away from said set position and said welding jig means, said set position being such that said plural component parts constituting said workpiece may be transferred from said preset jig means to said welding jig means by releasing said preset clamp means on said preset jig means and engaging said clamp means on said welding jig means.

4,535,928

DUAL PURPOSE CARTON

James L. Capo, Middletown, Ohio, assignor to International Paper Company, New York, N.Y.

Filed Nov. 2, 1983, Ser. No. 548,251
Int. Cl.³ B65D *85/28*
U.S. Cl. 229—16 R **14 Claims**



1. A carton structure including body side and end panels, bottom flaps connected to said body side panels along fold lines, and at least one top flap; and each of said body side panels, at least one of said body end panels, each of said bottom flaps, and said one top flap having lines of weakening therein for separating from said carton structure components of a caddy for pencils, crayons and the like, wherein said caddy includes two tubular bodies each formed from one of said body side panels, and each of said tubular bodies having bottom panels formed integrally therewith from that one of said bottom flaps hingedly connected to the respective one of said body side panels, and wherein each of said tubular bodies is triangular in cross-section, a bottom panel of one of said tubular bodies is of a matching triangular outline, and a bottom panel of the other of said tubular bodies is of a double triangular, diamond shape to underlie and close both tubular bodies.

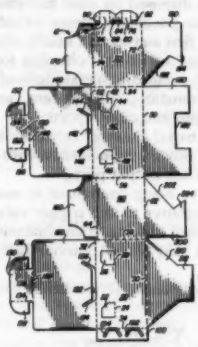
3. A caddy for pencils, crayons and the like, said caddy comprising two tubular bodies fashioned from sheet material and having like panels in back to back relation, and receiving means securing said like panels together, wherein said securing means includes a combined divider and locking member, and like panels of said tubular bodies and said combined divider and locking member have cooperating slits therein for locking entry of said member into bottom portions of said tubular bodies.

4,535,929

REUSABLE SHIPPING BOX WITH CAM TABS FOR RELEASE OF CLOSURE INTERLOCK

Ralph A. Sherman, II, and Calvin R. Watson, both of Mesa, Ariz., assignors to E-Z P.A.C., Inc., Mesa, Ariz.

Filed Sep. 19, 1983, Ser. No. 533,434
Int. Cl.³ B65D *5/10*
U.S. Cl. 229—39 R **18 Claims**



1. Carton apparatus, comprising, in combination:

first panel means defining one side of the carton apparatus;

first end panel means secured to the first panel means and defining a second side of the carton apparatus;

second panel means defining a third side of the carton apparatus and secured to the first end panel means remote from the first panel means;

second end panel means secured to the second panel means remote from the first end panel means and defining a fourth side of the carton apparatus;

means for securing together the first panel means and the second end panel means;

bottom panel means defining the bottom of the carton apparatus;

first top flap means secured to the first panel means, including first locking slot means disposed adjacent to the first panel means;

second top flap means secured to the second panel means;

locking tab means secured to the second top flap means remote from the second panel means apd adapted to extend through the first locking slot means to lock the second top flap means to the first top flap means; and

cam means for camming the locking tab means into alignment with the first locking slot means for unlocking the second top flap means from the first top flap means.

4,535,930

OVERNIGHT LETTER ENVELOPE

James O. Ward, Lake Oswego, Oreg., assignor to Nekoosa Envelopes, Inc., Englewood, Colo.

Filed Jan. 16, 1984, Ser. No. 570,881
Int. Cl.³ B65D *27/04, 27/08*
U.S. Cl. 229—71 **14 Claims**

1. An envelope comprising:

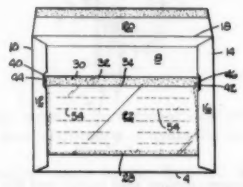
a continuous sheet of paper folded once about a fold line to form first and second panels;

said first and second panels having opposed inner surfaces and each having an outer surface;

said first and second panels having substantially the same width but said second panel being shorter in length than said first panel;

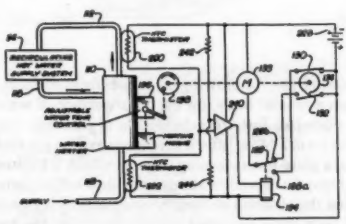
each of said panels having two lengthwise edges and two widthwise edges;

a pair of side panels each of which is joined to one of the lengthwise edges of said first panel by a fold line;
each of said side panels having a lengthwise free edge;
each of said side panels having a notch formed in the lengthwise free edges thereof;
a flexible transparent sheet superposed over a portion of said outer surface of said second panel;
said flexible transparent sheet having two lengthwise edges and two widthwise edges;
said side panels being folded over and secured to said outer surface of said second panel so that a major portion of the lengthwise edges of said flexible transparent sheet are located between said outer surface of said second panel and said side panels;
a minor portion of said lengthwise edges of said flexible transparent sheet is exposed at said notches;



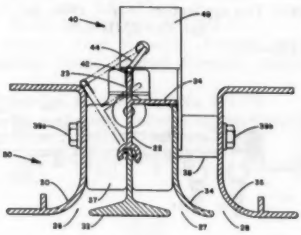
means securing said flexible transparent sheet in superposed position over said outer surface of said second panel to form a pouch between said outer surface of said second panel and an inner surface of said flexible transparent sheet;
said pouch being closed on three sides and having an opening located along a widthwise edge of said flexible transparent sheet having portions thereof adjacent said notches;
means adjacent said widthwise edge of said flexible transparent sheet for effecting a seal between said outer surface of said second panel and said flexible transparent sheet when desired; and
a flap extending from a widthwise edge of said first panel and having means for effecting a seal between said first and second panels when desired.

4,535,931
ENERGY CONSERVING WATER HEATER CONTROL SYSTEM
Stephen Bartok, Rancho Palos Verdes; Benjamin H. Stansbury, Jr., Beverly Hills, and Alan L. Backus, Los Angeles, all of Calif., assignors to Kenneth W. Scott, Coronado, Calif.
Filed Sep. 14, 1983, Ser. No. 531,998
Int. Cl.³ F23N *1/08*
U.S. Cl. 236—20 R **9 Claims**



1. An improved energy conserving water heater control system of the type having a water temperature control associated with the water heater adjustable to a warmer high demand setting and to a cooler energy saving standby setting, and having temperature sensors monitoring temperatures in thermal contact with an inlet pipe to said water heater and with an outlet pipe from said heater, wherein the improvement comprises:
a difference measuring arrangement connected between the inlet sensor and the outlet sensor; and
an adjusting means responsive to the difference measured by said arrangement for setting said control, when said difference approaches zero, to said cooler setting, and for setting said control, when the temperature sensed by said outlet sensor is substantially greater than the temperature sensed by said inlet sensor, to said warmer setting.

4,535,932
ACTUATOR FOR A HEATING/COOLING DIFFUSER
Carl C. Herb, Camillus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Jun. 11, 1984, Ser. No. 619,417
Int. Cl.³ F24F *13/10*
U.S. Cl. 236—49 **2 Claims**

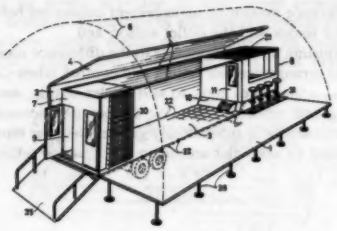


1. A thermally responsive actuator comprising:
thermally responsive means for producing linear motion by undergoing a reversible phase change;
rod means adapted to be movably secured at one end to said thermally responsive means for movement therewith and to be fixedly secured at another end so as to cause said rod means to be flexed in all positions of said thermally responsive means with the degree of flexure being determined by the position of said thermally responsive means; and
means for converting flexure of said rod means into rotary motion.

4,535,933
VEHICLE WITH TILTABLE SIDE WALLS
Johnny Kuiper, Nieuwegein, Netherlands, assignor to Foolish Fantasies B.V., Nieuwegein, Netherlands
Filed Aug. 2, 1984, Ser. No. 636,983
Claims priority, application Netherlands, Aug. 5, 1983, 8302783
Int. Cl.³ B60H *1/02*
U.S. Cl. 237—12.3 A **9 Claims**

1. A vehicle body comprising an elongated floor having a pair of opposed ends and a pair of opposed sides, fixed upright means at the opposed ends thereof, a pair of side walls pivotably connected to the opposed sides of said floor, a roof member pivotably connected to one of said side walls, said side wall and roof member being pivotable into substantially the plane of said floor to define a floor surface, elongated longitudinal supports between said upright means extending near the roof

member and within the space enclosed by said roof member and side walls, and an unspanned roofing of pliable material at



least partially supported by said elongated supports to enclose said floor surface.

4,535,934

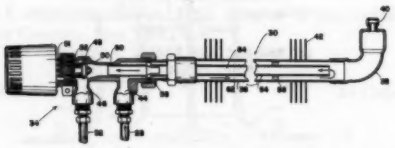
HOT WATER HEAT DISTRIBUTOR

Derek E. Rodd, 20 Hemlock Way, San Geronimo, Calif. 94963

Continuation-in-part of Ser. No. 339,306, Jan. 15, 1982, Pat. No. 4,498,623. This application May 7, 1984, Ser. No. 607,424

Int. Cl.³ F24H *3/00*

U.S. Cl. 237—70 **3 Claims**



1. For a water heating system, a reverse circulation heat distributing unit comprising:

a pair of inner and outer pipes;

heat transfer fins on said outer pipe;

a valve body connected to said outer pipe at one end thereof;

means closing off the other end of said outer pipe;

inlet and outlet flow ports opening laterally, respectively, to and from said valve body;

a longitudinal passageway in said valve body extending between said flow ports;

means sealing one end of said inner pipe in and around said passageway;

the other end of said inner pipe being open;

said inlet flow port being closer to said outer pipe than said outlet flow port so that water is circulated to said other end of the outer pipe around said inner pipe and then back through said inner pipe to said outlet flow port;

a valve seat around one end of said passageway; and

a valve closure member engageable with said valve seat to shut off flow from said outlet port.

4,535,935

RECHARGEABLE SACHET

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Oct. 13, 1983, Ser. No. 541,436

Int. Cl.³ A61L *9/04*

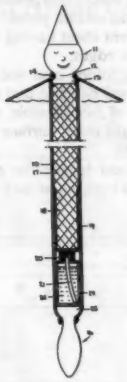
U.S. Cl. 239—34 **8 Claims**

1. A rechargeable sachet in a snake-like form so that it may be coiled about or otherwise applied to a mounting post, said sachet comprising:

A. an elongated sleeve of permeable, flexible fabric material having a predetermined length;

B. a cylindrical flexible core of absorbent material having good wicking properties stuffed in said sleeve, said core being shorter than said sleeve to define a free space therein;

C. a small squeezable bottle disposed in said free space and containing a supply of a liquid fragrance; and



D. means intercoupling said bottle and the adjacent end of the core to inject said liquid therein only when the sleeve is manually compressed to squeeze the bottle to produce an internal pressure therein.

4,535,936

BLAST NOZZLE FOR BLOWING OFF LIQUIDS FROM SURFACES

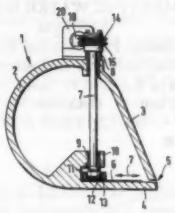
Paul Fontaine, Max-Planck-Ring 6, D-4018 Langenfeld, Fed. Rep. of Germany

Filed Sep. 8, 1983, Ser. No. 530,350

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3233963

Int. Cl.³ B05D *1/04*

U.S. Cl. 239—117 **6 Claims**

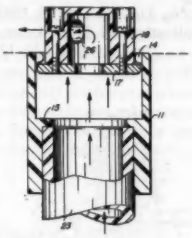


1. A blast nozzle for blowing off liquids from surfaces, which nozzle has a tubular body, on the outer surface of which converging plate-like lips are provided in a generally tangential manner to form a blow-off slit extending axially-parallel to the body, and a plate-form cleaning element which is located in the body and may be moved relative to the blow-off slit, characterized in that the cleaning element is connected to a transmission actuated by a drive provided outside the body, the transmission comprising at least two spaced adjusting rods which extend perpendicular to the cleaning element, each of the adjusting rods being provided with an eccentric lever connected to the cleaning element and mounted for rotation about its longitudinal axis.

4,535,937
GRADED ACTUATION OF HYDRAULICALLY ACTUATED POOL CLEANING HEADS

Joseph H. Fagan, 1312 N. Barkley, Mesa, Ariz. 85203, and Paul J. Pristo, 9046 N. 123rd St., Scottsdale, Ariz. 85259

Filed Apr. 20, 1983, Ser. No. 486,731
Int. Cl.³ B05B 3/06
U.S. Cl. 239—206 16 Claims



1. Hydraulically actuated core means captively ejectable from its housing upon application of hydraulic force comprising:

cylindrical housing means having first and second open ends, first diameter-reducing shoulder means adjacent said first open end, second diameter-reducing shoulder means at a selected position between said first and second open ends, diametrically opposed egress means interrupting said first diameter-reducing internal shoulder means;

annular weighting means insertable within said cylindrical housing means via said egress means and positionable thereafter within said housing means with its transverse axis orthogonal to the longitudinal axis of said housing means and reciprocal therein within limits defined by said first and said second diameter-reducing shoulder means;

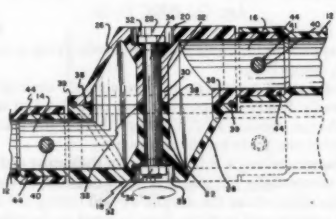
cylindrical core means insertable within said first open end of said cylindrical housing means and reciprocal therein and having a top end and a bottom end said top end lying at a selected position with respect to said first open end of said housing means when said bottom end is in contact with said annular weighting means and said annular weighting means is in contact with said second diameter-reducing shoulder; and

means for coupling said cylindrical core means to said annular weighting means after both have been positioned within said cylindrical housing.

4,535,938
FLUID TIGHT JOINT AND SYSTEM OF DISTRIBUTING FLUIDS

Tryon S. Lindabury, Sr., 2533 Claiborn Cir., Wichita, Kans. 67226

Filed Sep. 27, 1982, Ser. No. 423,867
Int. Cl.³ A01G 25/02
U.S. Cl. 239—269 5 Claims



1. A fluid-tight joint for connecting fluid conduits in series comprising an inlet port and a discharge port, each port communicating with a body element having a central bore and a peripheral flange, the flange of the inlet port mating with the flange of the discharge port so that the central bores fall into register with one another and the body elements of the respective ports communicate so that fluid introduced into said inlet port exits through said discharge port;

fastener means received in said bores for securing said body elements together while providing an axis for relative motion between said ports;

and seal means sandwiched between said flanges and said bores for maintaining a fluid-tight connection while permitting said relative motion of said ports about said axis;

said flanges are generally L-shaped, and part of the exterior surface of each body element partially generally defines a cone including a recess, said central bores extend through said partial cones from the recesses;

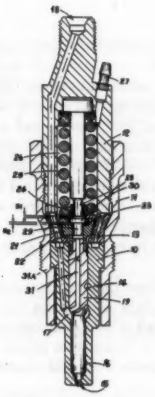
said joint additionally comprising a sleeve means extending through said central bores, said sleeve means being flared at each end and flushed against the bottom of each recess;

said seal means is sandwiched against said sleeve means, and said fastener means extends through said sleeve means and includes ends which are flushed against the flared ends of the sleeve means.

4,535,939
FUEL INJECTION NOZZLES

Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Oct. 11, 1983, Ser. No. 540,570
Claims priority, application United Kingdom, Oct. 23, 1982, 8230331
Int. Cl.³ F02M 61/16
U.S. Cl. 239—533.3 6 Claims



1. A fuel injection nozzle for supplying fuel to an internal combustion engine comprising a nozzle body, a bore formed in the body, a seating defined at one end of the bore, an outlet from said one end of the bore, a valve member slidable within the bore, said valve member being shaped for co-operation with said seating, a passage through which in use fuel can flow at high pressure to act upon an area of said valve member to lift the valve member away from said seating thereby to allow flow of fuel through said outlet, resilient means for opposing the movement of the valve member, an adaptor mounted upon the valve member and which serves to transmit to the valve member the force exerted by said resilient means, a cylinder defined in the adaptor, a plunger slidable in the cylinder, passage means for admitting fuel under pressure to one end of said cylinder, the force produced by the fuel under pressure acting

on said plunger opposing the action of said resilient means, and stop means for limiting the movement of the plunger, the arrangement being such that the initial movement of the valve member against the action of the resilient means, is assisted by the action of said plunger, the final movement of the valve member after the movement of the plunger has been halted, being due to the fuel under pressure acting on the valve member only.

4,535,940

METHOD OF REPLASTIFYING THERMOPLASTIC STRIPS, FOILS OR WEBS

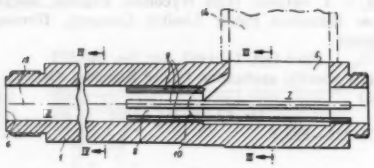
Hans Geng, Kelberg, Fed. Rep. of Germany, assignor to Plastik-Maschinenbau GmbH & Co., KG, Kelberg, Fed. Rep. of Germany

Division of Ser. No. 167,016, Jul. 9, 1980, abandoned. This application Jul. 27, 1983, Ser. No. 517,633

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010825

Int. Cl.³ B02C *19/22*

U.S. Cl. 241—3 **1 Claim**



1. A method of replastifying thermoplastic foil strips, comprising the steps of:

rotating a worm within a cylinder barrel having a chamber surrounding said worm at an inlet end, an axial outlet at an opposite end of said barrel, and a widened area in the region of said inlet end;

winding at least one continuous thermoplastic foil strip in multiple layers completely around said worm in the widened area of said chamber wherein said strips are laterally fed into said chamber;

compressing the layers of said at least one strip on said worm;

snagging said at least one strip wound on said worm in said chamber on edges of at least one longitudinal groove formed on a wall of said chamber, thereby causing said at least one strip to be cut into pieces;

advancing said pieces from said chamber by rotation of said worm; and

masticating and plastifying said pieces along said barrel, said chamber having a lateral feed opening bounded in part by a vertical surface extending parallel to an axis of said worm and said chamber and wherein said chamber is defined in part by a cylindrical surface formed in said barrel concentrically with said axis and in part by an additional surface joined on one side to said cylindrical surface at a cuspidal line extending parallel to said axis and on an opposite side to said vertical surface in a smooth connection, said additional surface spiraling outward from said cuspidal line to said vertical surface, so that said chamber is formed with an eccentric peripheral space sickle-shaped in cross section traverse to said axis whereby the foil strips are wrapped around said worm until they are compressed in said space in the sickle-shape cross section of said space.

4,535,941

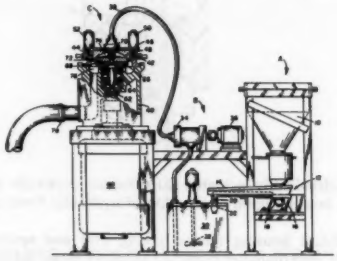
METHOD OF COMMINUTING ELASTOMERIC PELLETS

Ronald L. Brubaker, Euclid; James J. Tloczynski, Parma, both of Ohio; Melvin Budzol, Schaumburg, Ill.; Clifford J. Ahola, Cleveland, Ohio; Frederick P. Boyle, Euclid, Ohio; Truman D. Parkinson, Chardon, Ohio, and James C. Rine, Lake City, Fla., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 316,217, Oct. 29, 1981, Pat. No. 4,469,284. This application Jul. 3, 1984, Ser. No. 627,539

Int. Cl.³ B02C *19/12*

U.S. Cl. 241—21 **18 Claims**



1. A method of comminuting vulcanized rubber pellets with a median diameter of at least one-eighth inch to particles having a median diameter by number of less than 50 microns in a single pass, the method comprising:

receiving a slurry of the pellets and water in a receiving region disposed between a rotor and a stator, the rotor and stator having peripheral abrasive surfaces surrounding the receiving region for defining a grinding zone therebetween;

urging the pellets along outward extending recesses in the rotor abrasive surface by rotating the rotor, the rotor recess having a sloping portion along a trailing edge relative to the direction of rotation;

wedging the pellets between rotor recess sloping portion and the stator peripheral abrasive surface and into the grinding zone;

continuing rotation of the rotor comminuting the pellets into particles between the stator and rotor peripheral abrasive surfaces until the particles have a median diameter of less than 50 microns.

4,535,942

APPARATUS FOR CONTAINING EASILY SOLIDIFYING POWDER AND PARTICLES

Takeshi Hayashi, Naruto, Japan, assignor to Kyoeizoki Co., Ltd., Naruto, Japan

Filed Nov. 22, 1982, Ser. No. 443,652

Claims priority, application Japan, Dec. 2, 1981, 56-194875; Dec. 3, 1981, 56-195236

Int. Cl.³ B02C *19/12*

U.S. Cl. 241—36 **8 Claims**

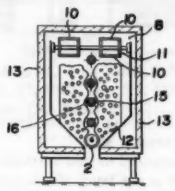
1. An apparatus for containing easily solidifying powder and particles, comprising:

a casing having a capacity for containing a desired amount of easily solidifying powder and particles and having a discharge opening in the bottom thereof for discharging powder and particles therethrough;

a discharge conveyor in the bottom of the casing and extending substantially horizontally from one end of the casing to the other along the middle of said casing for transferring powder and particles from one end to the other of the bottom of the casing, the discharge end of said discharge conveyor being communicated with said discharge opening;

a plurality of horizontally extending crusher shafts each extending substantially the full length of said casing and having a plurality of claws on the circumferential surface thereof and said shafts being positioned in a vertical plane directly above the discharge conveyor in the middle of said casing for engaging all of a vertically extending face of powder and particles extending substantially vertically from the discharge conveyor in a flat plane to a level corresponding to the level of the top of the body of powder and particles normally contained in the casing, and drive means connected to said shafts for rotating said shafts for clawing powder and particles from the face of the powder and particles to permit powder and particles to fall downward to said discharge conveyor;

said casing having side walls spaced outwardly from said crusher shafts a distance substantially greater than the diameter of said crusher shafts and having a bottom surface inclined downwardly to said discharge conveyor from the opposite sides of said casing, the angle of inclination being sufficient to cause the powder and particles to slide downwardly and inwardly toward said crusher shafts and said discharge conveyor due to their own weight, whereby powder and particles which fall down to said discharge conveyor are transferred by said discharge conveyor to the outside of said casing and the powder and particles left in said casing above said discharge conveyor slide on the bottom surface of said casing toward said crusher shafts and are pressed against said crusher shafts from the opposite sides of said vertical plane to balance the force of the powder and particles on said crusher shafts, the powder and particles in said casting being successively acted on by said crusher shafts and by said discharge conveyor and are discharged by said discharge conveyor to the outside of said casing.



4,535,943

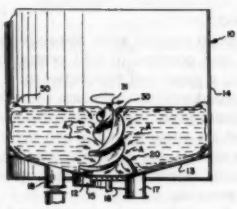
PULPING APPARATUS INCLUDING A ROTOR AND HELICAL SCREW FLIGHTS EXTENDING UPWARDLY FROM THE ROTOR

Joseph W. Couture, Dorval, Canada, assignor to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 495,872, May 18, 1983, abandoned. This application Aug. 24, 1984, Ser. No. 644,644

Int. Cl.³ B02C *13/18*

U.S. Cl. 241—46.02 **8 Claims**



1. Apparatus for pulping high consistency paper pulp comprising:

(a) a tub having a bottom wall and a generally cylindrical side wall extending upwardly from said bottom wall;

(b) a rotor mounted centrally of said bottom wall for rotation about a vertical axis and including a base portion and a plurality of vanes extending generally radially outwardly from said base portion and having defibering faces thereon,

(c) a plurality of helical screw flights extending upwardly from said base portion, each of said flights having a concave undersurface and having also a trailing portion terminating at said base portion and having a width in a radial direction substantially equal to the radial length of said vanes,

(d) the height of said rotor being greater than the diameter thereof, and

(e) means for rotating said rotor with said concave undersurfaces constituting the leading surfaces of said flights to cause said undersurfaces to channel high consistency pulp in their paths and push such channeled pulp downwardly to said defibering faces, whereupon said faces impel said pulp outwardly along said bottom wall and toward said side wall with minimal cavitation.

4,535,944

SPINNING MACHINE WITH A DOFFING APPARATUS

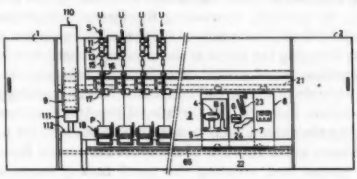
Teiji Nakahara; Shoji Sakai; Koshi Noda; Michiaki Fujiwara, and Nobunori Kubota, all of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Jul. 15, 1983, Ser. No. 514,097

Claims priority, application Japan, Jul. 19, 1982, 57-126546

Int. Cl.³ B65H *54/20, 54/26, 67/04*

U.S. Cl. 242—35.5 A **9 Claims**



1. A spinning machine of the type wherein a yarn knotting truck having a knotter provided thereon is adapted to travel in a truck travelling space provided along a number of spinning units included in said spinning machine, the travelling of said knotting truck being controlled in a known manner in order to successively effect knotting at said individual spinning units, further comprising:

a doffing truck;

a doffing apparatus, carried on said doffing truck, said doffing apparatus being operably adapted for effecting doffing of packages of said spinning units which have a fully wound yarn package thereon; and

means, associated with each spinning unit, for sensing the presence of a fully wound yarn package, for identifying the spinning unit containing said fully wound yarn package, and for communicating a doffing request signal to said doffing truck;

said truck travelling space being formed internal of each spinning unit such that a knotting operation and a doffing operation may be directly observable;

said doffing truck being caused to operate, in response to the doffing request signal, so that it travels in said truck travelling space until aligned, by known means, with the spinning unit communicating the doffing request signal whereat said doffing of the package is effected.

4,535,945

METHOD AND DEVICE FOR LOCATING AND HOLDING A THREAD END

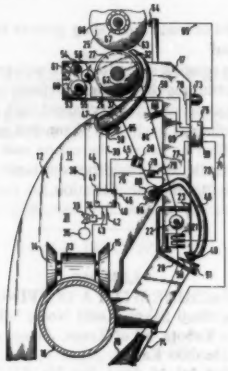
Joachim Rohner, Monchen-Gladbach, and Heinz Kamp, Wegberg, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Jul. 7, 1983, Ser. No. 511,778

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225379

Int. Cl.³ B65H *54/22*

U.S. Cl. 242—35.6 R **13 Claims**



1. Method for locating and holding an end of a thread wound on a spool at a winding station, with a thread connector having a thread suction nozzle with a thread sensor connected thereto, for partially unwinding the thread, which comprises starting the thread connector with the winding station, simultaneously bringing the spool at the winding station to a standstill after rotation in a forward direction and bringing the thread suction nozzle of the thread connector from a starting position to a position close to the surface of the spool, subsequently supplying the thread suction nozzle with suction for a limited time as soon as the rotation of the spool has ceased for sucking-in the thread end, rotating the spool in a reverse direction during the suction step after the rotation of the spool has ceased, subsequently holding the sucked-in thread end with the suction nozzle, subsequently moving the thread suction nozzle back to the starting position thereby inserting the thread into the thread connector if the sensor has sensed the presence of the thread in the thread suction nozzle, while bringing the spool to a standstill again, and supplying the thread suction nozzle with suction again before moving the thread suction nozzle to the starting position if the thread is not sensed by the sensor.

4,535,946

FIXED POSITION MACHINE FOR COILING DOWN A CABLE

Henri Thevenon, Lyons, France

Filed Jun. 4, 1984, Ser. No. 616,762

Claims priority, application France, Jun. 3, 1983, 83 09228

Int. Cl.³ E21B *19/00*; B21C *47/00*; B65H *75/36*, *54/76*

U.S. Cl. 242—54 R **4 Claims**

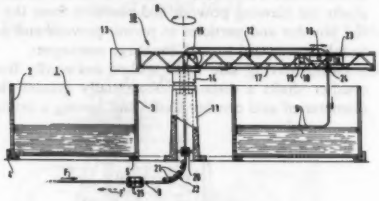
1. A fixed position machine for coiling down a cable in successive layers inside a circular tank having a vertical axis, said machine comprising:

a hollow column vertically situated on the axis of the tank, a horizontal arm mounted for rotation on said column above said tank;

means including an inlet curve of fitted rolls, for passing a cable to be coiled down under the tank and around said inlet curve of fitted rolls and up through the hollow column;

a guide pulley mounted at a fixed location on said arm for rotation about a horizontal axis above said column, said cable passing up through said hollow column being leaved about said guide pulley such that said guide pulley deflects the cable to cause it to run horizontally along the arm after emerging from the top of the column;

a carriage mounted on said arm for movement horizontally along said arm towards and away from said guide pulley,



said carriage including a motor for driving said carriage along said horizontal arm;

a drive pulley mounted to said carriage for rotation about a horizontal axis at the level of said guide pulley and being in line therewith and receiving said cable passing over said guide pulley;

a motor on said carriage for rotating said drive pulley about its axis; and

said cable passing about said drive pulley and deflected vertically downwardly into said tank at a selectable point within said tank.

4,535,947

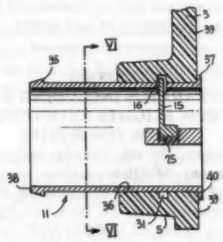
PAPER TOWEL INSERT AND DISPENSER

Jerry Hidle, Panama City, Fla., assignor to Pandhandle Industries, Inc., Panama City, Fla.

Filed Apr. 3, 1984, Ser. No. 596,352

Int. Cl.³ B65H *19/00*

U.S. Cl. 242—55.2 **9 Claims**



1. A paper roll dispenser, comprising:

a central body portion;

first and second support arms respectively extending from opposite end portions of said central body portion for supporting a paper roll therebetween;

first and second support cylinders provided on respective end portions of said support arms for insertion within the paper roll for supporting the roll thereon, said support cylinders each having a predetermined length and extending inwardly toward each other from inner surfaces of said end portions;

a support tube axially received within at least one said support cylinder for axial movement relative thereto and having a length substantially greater than said predetermined length of said one support cylinder, grasp means on

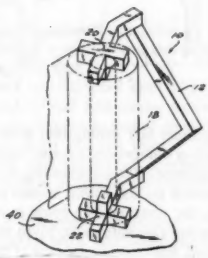
said support tube for axially moving said tube within said one support cylinder between an inwardly projected position and an outwardly extended position, first means on said support tube extending radially outwardly from the outer surface thereof engageable with said one support cylinder for limiting movement of said tube in said outwardly extended position thereof, and second means on said support tube extending radially outwardly from said outer surface thereof engageable with said one support cylinder for limiting movement of said tube in said inwardly projected position thereof and for retaining said tube in said inwardly projected position, whereby said support tube in said inwardly projected position thereof extends a greater distance within the paper roll compared to that of said one support cylinder for further supporting the roll and for preventing unintended removal of the paper roll from the dispenser.

4,535,948

DISPENSER

Mark Gillen, 675 Hudson St., New York, N.Y. 10014

Filed Sep. 17, 1982, Ser. No. 419,169
Int. Cl.³ B65H *75/02*
U.S. Cl. 242—55.2 **2 Claims**



1. A single piece dispenser for use in a dispensably holding roll of product maintained on a tubular roll, said dispenser comprising:

base portion formed in a substantially V-shaped configuration to alternatively be effectively fastened to a surface by a single fastener, removably and evenly supported on its base portion by a flat surface such as shelf, chair back, door knob or the like;

supporting means which includes two similarly shaped supporting arms oppositely disposed with respect to each other and respectively coupled at one end to respective ends of the base portion, said supporting arms extend outward and upwardly away from said base portion and legs attached to a respective distal end opposite said one end of said supporting arms and disposed at an angle with the respective arms to form a flat member perpendicular to the plane of said base portion of sufficient area to support said dispenser on a surface when said dispenser is rested on said surface with said flat member providing the contacting area with said surfaces;

means engageable with the tubular rolls respective ends, said engageable means comprising two oppositely disposed axially aligned nipples positioned on said respective flat members, said nipples being of a diameter slightly smaller than the diameter of the tubular roll, said dispenser being sufficiently flexible to allow the nipples to be inserted in respective ends of the tubular roll and allow the roll to axially rotate thereabout and said nipples being so positioned that a tubular roll maintained thereby is disposed parallel to the plane of the base position; and

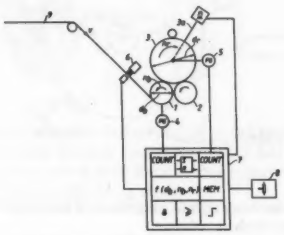
extension members coupled between said supporting arms and respective ends of the base portion, said extension members being disposed substantially perpendicular to the base portion's plane and of sufficient length so as to maintain said tubular roll at a predetermined distance from said base portion.

4,535,949

LENGTH MEASURING DURING ROLLING UP OF THIN MATERIAL

Ingemar Olsson, Vesteras, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 12, 1984, Ser. No. 619,826
Claims priority, application Sweden, Jun. 13, 1983, 8303343
Int. Cl.³ B65H *17/12, 25/00*
U.S. Cl. 242—57 **4 Claims**



1. A measuring device in a winding machine for measuring the length of material wound on a roll when a break in the material has occurred, which device includes

a unit for setting the desired length of material on the roll,

a first pulse transducer,

means connected to the first pulse transducer to monitor the passage of material to the roll and to ensure that the pulse output of the first pulse transducer is related to the length of such material passage,

a pulse counter for counting the pulses supplied by the first pulse transducer,

a unit for comparison of the set and the measured length of wound material,

drive equipment for the roll, and

a break indicator for sensing any break in tne material fed to the roll,

characterized in that,

means is provided to measure the circumference of the roll when a material break is indicated while at the same time the length measuring is stopped,

means to store the said measure of the circumference of the roll and

means, after rejoining of the material and restart of the winding up, to resume the length measuring when the circumference of the roll acquires the stored value of the circumference of the roll at the moment of material break.

4,535,950

METHOD AND APPARATUS FOR ROLL WINDING MEASUREMENT

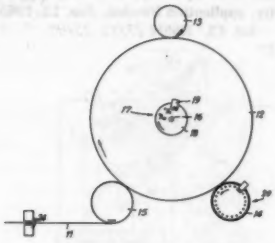
Khaim Lisnyansky, Chester, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Jan. 13, 1984, Ser. No. 570,360
Int. Cl.³ B65H *17/08*
U.S. Cl. 242—66 **9 Claims**

1. Apparatus for measuring the length of successive layers of a web of flexible material wound on a roll by a winder, for determining the compressive strain on the web of flexible material and for determining the accumulated length of the material which has been wound onto the roll, which comprises:

first pulse encoder means for generating signals representing a first portion of a rotation and a second portion of a rotation of the roll onto which the material is wound,

second pulse encoder means for generating signals representing the length of material being wound onto the roll,
processor means, responsive to said signals from said first and second pulse encoders, which measures for each revolution of said roll the length of material wound onto the roll during that revolution and the accumulated length of material wound onto the roll from the start of the roll,
memory means for storing said length measurements for each revolution and said accumulated length measurements,



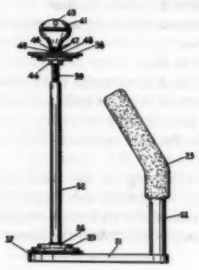
means for deriving signals indicative of said length measurements for each revolution,
means for combining and transforming said indications into a further indication of the compressive strain on at least one layer of the material wound onto the roll, and
reset control means for correcting the accumulated length measurement after at least one defective layer of material has been removed from the roll.

4,535,951

STRETCH FILM WRAPPING DEVICE

Paul K. Riemenschneider, III, Grandville, Mich., assignor to Highlight Industries, Inc., Grand Rapids, Mich.

Filed May 2, 1983, Ser. No. 490,845
Int. Cl.³ B65H *23/06*; B44C *7/00*
U.S. Cl. 242—754 **18 Claims**



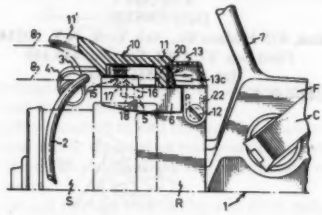
1. A stretch film wrapping device for rotatably supporting a roll of plastic film having a tubular rigid central core comprising:
a base member;
a bottom core holder on said base member for rotatable engagement by one end of said film roll core;
a top core holder opposing said bottom core holder for engagement by the other end of said film roll core;
a length adjustable axle member interconnecting said core holders to effect clamping of said film roll between said core holders; said top core holder being rotatably mounted on said axle member and axially shiftable upwardly on said axle member; and
a top tension control assembly above said top core holder at the top end of said axle member for adjusting the clamping force on said film roll including compression spring biasing means engaging said top core holder to resist upward axial shifting of said top core holder when said axle member is adjusted to reduce the distance between said core holders to effect clamping of said film roll between said core holders to permit gradual changes in the clamping force between said core and core holders such that film roll rotation resistance and thus film tension can be predictably adjusted through a wide tension range.

4,535,952

BAIL OPERATING MECHANISM FOR FISHING REELS

Lars-Olof Carlsson, Asarum, Sweden, assignor to Abu Aktiebolag, Svangsta, Sweden

Filed Dec. 5, 1983, Ser. No. 557,974
Claims priority, application Sweden, Dec. 15, 1982, 8207160
Int. Cl.³ H01K *89/01*
U.S. Cl. 242—84.2 G **3 Claims**



1. An arrangement in a fishing reel with spring biasing and locking mechanism comprising a frame supporting a line spool and having at an upper side a connecting foot, a rotor which is rotatably supported by the frame, means comprising a hand-operated crank for rotating said rotor in relation to the line spool, a bail having opposite ends, pivot means supported by the rotor and bail, bail arms supported at the ends of said bail and connecting the bail to the rotor via said pivot means which permits pivotable movement of the bail from a line winding first position for winding the fishing line upon the line spool when the rotor is rotated by means of said crank, to a second position in which the bail permits the fishing line to run out freely during casting, a spring means for the biasing of said bail to said first position and a locking means for the locking of the bail in its second position and unlocking of the bail to permit return of said bail to said first position by rotation of said rotor by means of said crank for winding in the line, an operating mechanism for pivoting said bail into said free second position against the action of said spring means, said operating mechanism comprising a member supported by said rotor and extending with a portion thereof substantially parallel to the rotor axis in spaced relation to the rotor circumference, and an operating arm pivotally connected with said member, such that said operating arm, when in a position at the upper side of the fishing reel, is accessible to a finger of a hand held in a position adjacent said foot at the upper side of said fishing reel, said operating arm being mounted pivotably about a pivotable axis substantially perpendicular to the rotor axis, an intermediate movable link acting between said bail and said operating arm, said intermediate link and said bail arm comprises cooperating guiding and engaging means, said guiding means comprises an elongated slot, and said engaging means comprises a projection which movably engages said elongated slot for movement therealong to and from an abutment means for pulling the link rearwardly substantially in parallel with the rotor axis pivoting said bail arm manually outwards from the rotor, the outer end portion of said link being pivotably connected to one of said bail arms at a radial distance from the axis of rotation of said bail arm about said pivot means relative to the rotor, and the radius from said pivotable axis of the bail arm to the pivotable axis of the link relative to the bail arm forms an

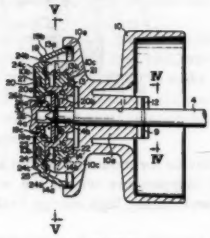
obtuse angle to the path of relative movement between said guiding and engaging means.

4,535,953

SPINNING TYPE FISHING REEL WITH AXIALLY ADJUSTABLE SPOOL

Hatsutaro Omori, Oyama-higashi, Japan, assignor to Kabushiki Kaisha Ohmori Seisakusho, Japan

Filed Dec. 28, 1983, Ser. No. 566,229
Int. Cl.³ A01K *89/01*
U.S. Cl. 242—84.21 R **3 Claims**



1. A spinning type fishing reel, comprising:
(a) a spool shaft having a tapered end and an annular groove adjacent said tapered end;
(b) a spool mounted on said spool shaft so as to be rotationally fixed relative thereto and axially movable thereon;
(c) an adjustment mechanism mounted on said spool shaft so as to be axially fixed relative thereto and rotationally movable thereon, said adjustment mechanism for adjusting the axial position of said spool relative to said spool shaft;
(d) a screw drive assembly, comprising a male threaded construction coaxial with said spool shaft and a female threaded construction threadedly cooperating with said male threaded construction and also coaxial with said spool shaft, one of said male and female threaded constructions being fixed relative to said adjustment mechanism, and the other of said male and female threaded constructions being fixed relative to said spool;
(e) stepping mechanism means for providing stepwise motion between said adjustment mechanism and said spool;
(f) a shaft grip spring mounted to said adjustment mechanism and substantially fixed thereto with regard to relative movement therebetween in the axial direction, said spring having an engagement portion which engages said spool shaft annular groove and retains said adjustment mechanism and said spool on said spool shaft; and
(g) a release mechanism mounted with said adjustment mechanism for releasing said spool and adjustment mechanism from said spool shaft by releasing said spring from said shaft annular groove, said release mechanism comprising a push button having a tapered end spring engaging surface for separating said spring from said annular groove.

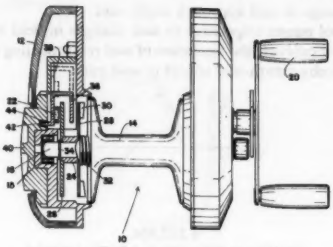
4,535,954

FISHING REEL WITH DELAYED ACTION BRAKE

Charles C. Worth, Kentfield, and John N. Young, Fairfax, both of Calif., assignors to Charles C. Worth Corporation, Kentfield, Calif.

Filed Jun. 4, 1984, Ser. No. 617,103
Int. Cl.³ A01K *89/02*
U.S. Cl. 242—84.52 B **4 Claims**

1. In a rotating spool casting reel comprising:
a frame;
a shaft rotatable on said frame; and
a spool fixed on said shaft to rotate therewith;
the improvement comprising:
a magnet carried on said frame;
a metallic rotor rotatable with said shaft but slidable thereon toward and away from said magnet;
spring means biasing said rotor toward said magnet; and



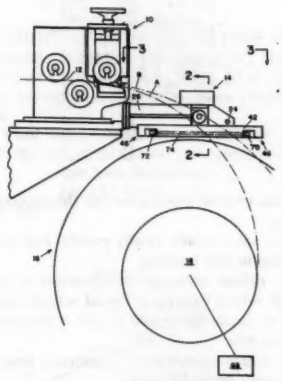
air deflector means carried on said rotor and disposed so that air impinging thereon, during rotation of said rotor when casting, imposes an axial force vector against said rotor in opposition to said spring means.

4,535,955

MEANS FOR SENSING AN UNDESIRABLE APPROACH ANGLE IN A LEVEL WIND COILER

Donald J. Custer, Akron, Ohio, assignor to Morgan Construction Company, Worcester, Mass.

Filed Mar. 31, 1983, Ser. No. 480,654
Int. Cl.³ B65H *54/28*
U.S. Cl. 242—158 R **4 Claims**



1. For use in combination with a guide device for directing an elongated strand to a rotating spool on which the strand is wound into a coil consisting of multiple layers of strand windings, with the optimum arrangement of the windings in each layer being dependent upon the strand passing from the guide device to the spool along an unrestrained path defining a selected approach angle with respect to the rotational axis of the spool, a control system for maintaining the strand on said path, said system comprising:
reciprocating means for arranging the windings on said spool by producing relative reciprocal motion between said guide device and said spool;
means for generating a pair of parallel high intensity fields spaced one from the other in the direction of the spool axis, the said fields being located on opposite sides of said

path and defining a gap therebetween in which said strand may move to accommodate variations in the diameter of the coil being formed on said spool while allowing the intensities of said fields to remain unaffected;

detector means for detecting changes in the intensities of one or the other of said fields occasioned by the strand straying from said path into said fields, thereby causing a change in said approach angle; and

control means responsive to said changes in field intensities for modifying the operation of said reciprocating means to thereby return said strand to said path.

4,535,956

THREAD BRAKING MECHANISM

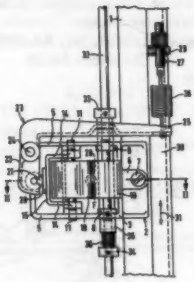
Edwin Wildi, Niederuzwil; Erwin Bossart, Flawil, and Hans Hasler, Uzwil, all of Switzerland, assignors to Maschinenfabrik Benninger AG, Uzwil, Switzerland

Filed Sep. 4, 1984, Ser. No. 647,369

Claims priority, application Switzerland, Sep. 14, 1983, 5005/83

Int. Cl.³ B65H *59/16, 59/22*

U.S. Cl. 242—151 9 Claims



1. A thread braking mechanism for thread comprising:

a housing;

two rollers substantially axially parallel and freely rotatably journaled in said housing;

said two rollers defining therebetween a clamping bite through which extends a thread which causes said two rollers to rotate while said thread is drawn through said clamping bite;

said two rollers comprising a stationary first roller and a displaceable second roller;

a force accumulator operatively connected to said displaceable second roller such as to displace said displaceable second roller relative to said stationary first roller in a substantially axially parallel manner and to resiliently press with an adjustable operating bias said displaceable second roller against said stationary first roller;

a rapid braking device comprising an individual spring means operatively associated with said displaceable second roller in order to suddenly increase the force acting thereupon for a rapid-braking operation; and

said spring means, in an operative state of said rapid-braking device, subjecting said displaceable second roller to a stopping force in order to suddenly increase the force acting thereupon and to rapidly brake said two rollers independently of the action of said force accumulator which generates said operating bias.

4,535,957

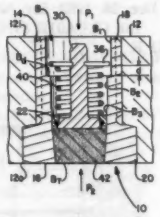
SAFETY DEVICE FOR VENTING AIRCRAFT TIRES

Andrea L. Bischoff, and Robert W. Chin, both of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Jul. 18, 1983, Ser. No. 514,737

Int. Cl.³ B64C *25/00*

U.S. Cl. 244—103 R 5 Claims



1. A safety device for mounting within an aircraft wheel to vent a tire of overpressure within the wheel/tire assembly generated by heat during high energy braking comprising in combination:

a cylindrical housing received within the wheel defining an axial bore which extends from the outside to the inside of the wheel/tire assembly;

a eutectic material plug coaxially mounted within and filling the bore toward the outside end thereof and adapted to melt at a predetermined temperature of the wheel; and

valve means coaxially mounted and completely contained within the bore toward the inside end thereof, said valve biased in a position to close off the bore under normal tire pressure and also maintained in the closed position by the presence of the eutectic plug within the bore;

said eutectic plug being melted out of the housing bore when the wheel temperature reaches a predetermined high limit to allow operation of the valve means wherein the valve means is opened by overpressure within the tire which overcomes the bias to vent the overpressure axially through the bore to the outside, said valve means being returned to the closed position when the tire pressure drops to a value insufficient to overcome the bias on the valve means.

4,535,958

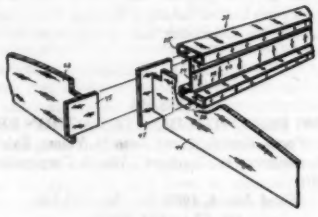
ALUMINUM COMPOSITE SPAR WING STRUCTURE AND METHOD OF ASSEMBLY

Gary A. Hutchison, 207 Plymouth Dr., Charlotte, Mich. 48813

Filed Dec. 13, 1982, Ser. No. 448,966

Int. Cl.³ B64C *1/26, 3/18*

U.S. Cl. 244—123 4 Claims



1. In a composite spar wing structure assembly comprising:

an elongate wing spar having a substantially I cross-sectional configuration, said wing spar defining a central web portion having a pair of opposed hollow flange members

provided therealong, said wing spar configured to make snap-engagement with front rib-plates of spaced-apart front ribs positioned along the front of said wing spar, said wing spar defining a pair of opposed longitudinal access slots at the junctures between each of said hollow flange members and said central web portion, said longitudinal access slots adapted to slidably receive rear rib-plates of spaced-apart rear ribs positioned along the rear of the said spar;

a plurality of said spaced-apart front ribs positioned along the front of said wing spar, said front ribs provided with said front rib-plates which are adapted to make snap engagement with said wing spar between said hollow flange members; and

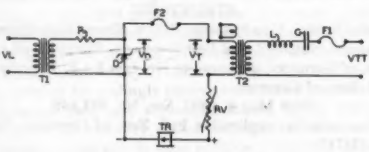
a plurality of said spaced-apart rear ribs positioned along the rear of said wing spar, said rear ribs provided with said rear rib-plates which are adapted to make sliding engagement with said longitudinal access slots so as to maintain said rear ribs in a spaced-apart relationship along the rear of said wing spar.

4,535,959

VITAL SOLID STATE RELAY FOR RAILROAD ALTERNATING CURRENT TRACK CIRCUITS

Heinz Gilcher, Export, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Aug. 2, 1982, Ser. No. 404,182
Int. Cl.³ B61L *21/00, 25/00*
U.S. Cl. 246—34 R **7 Claims**



1. A vital solid state relay arrangement comprising,

(a) first input means coupled for receiving a first alternating current signal from a first source having a selected signal frequency,

(b) a second input means coupled for at times receiving a second alternating current signal from a second source, said second signal having said selected frequency and a predetermined phase relationship with said first signal,

(c) a varistor element,

(d) a register means normally occupying a first position and operable to a second position,

(e) a register network coupling said first and second input means, said varistor element, and said register means for operating said register means to its second position to register the presence of said second signal only when both signals are present and within said predetermind phase relationship,

(f) a first transformer coupled to said first source for producing a selected level first signal at its secondary winding output, and

(g) a Zener diode having a preselected regulating level connected across said first transformer secondary winding, and

(h) the multiple path circuit through said secondary winding and said diode coupled for supplying rectified square wave pulses with peaks at said preselected regulating level into said register network.

4,535,960

CABLE CLAMP WITH ALIGNMENT MEANS

Gerald T. Downing, Port Washington, and Gregory W. Gyllstrom, Waukesha, both of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Jun. 27, 1983, Ser. No. 507,650
Int. Cl.³ F16L *3/08*
U.S. Cl. 248—74.5 **7 Claims**

1. In a cable clamp of the type including an arcuate central body portion, a first flat end portion extending from one end of the central body portion, a second flat end poriton extending from the opposite end of the central body portion, and an aperture in the first flat end portion and an aperture in the second flat end portion, the improvement wherein:

(1) one of the flat end portions includes a peripheral flange extending toward the other flat end portion,

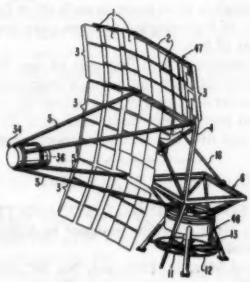
(2) the other flat end portion includes a tongue proportioned to nest within the peripheral flange when the first and second end portions are in engagement with one another, whereby the apertures in the two flat end portions are in registry for attachment of the cable clamp to an object upon engagement of the first and second flat end portions.

4,535,961

LIGHTWEIGHT AZIMUTH/ELEVATION MOUNT

Isidore F. Sobczak; William C. Cleveland, Jr., both of Santa Ana, and Robert L. Pons, Mission Veijo, all of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Mar. 8, 1982, Ser. No. 355,409
The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.
Int. Cl.³ F16M *11/12*
U.S. Cl. 248—183 **5 Claims**



1. An azimuth/elevation mount for supporting and orienting a structure about an azimuth axis and an orthogonal elevation axis, comprising:

a rotary turret supporting said structure, said turret having an upper part generally in the shape of an inverted pyramid; and

a base, generally in the shape of a pyramid, for supporting said rotary turret and allowing said turret to rotate 360°

about its center vertical axis which is coincident with the azimuth axis; wherein

protruding from a bottom surface of the inverted pyramid part of the turret and fixedly attached thereto by means of a first wheel near its top is a vertical generally cylindrical torque tube, said torque tube, as it rotates, being directly embraced and restrained radially at two widely separated regions therealong by two bearings rigidly suspended from upper and lower portions, respectively, of the base, said bearings serving to react overturning loads from the structure through the base; and

a second, horizontal, drive wheel larger than the first wheel is rigidly affixed near the tube bottom for imparting azimuthal motion to the turret and structure; wherein

all portions of the inverted pyramid part of the turret lie above the base.

4,535,962

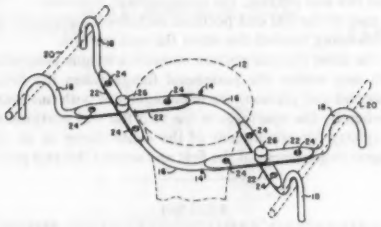
OBJECT HOLDING DEVICE FOR DECORATIVE STRUCTURE

David M. F. Chan, 1213 King Dr., El Cerrito, Calif. 94530, and Michael L. F. Chan, 1407 Arch St., Berkley, Calif. 94708

Filed Jun. 30, 1983, Ser. No. 509,966

Int. Cl.³ E04G *3/00*

U.S. Cl. 248—214 **4 Claims**



1. The device for holding an object comprising

a first end support member,

a second end support member spaced apart from said first end support member,

a first generally V-shaped object support member having its apex proximate the midpoint thereof with a first pair of legs extending at an angle to each other from said apex,

a second generally V-shaped object support member having its apex proximate the midpoint thereof with a second pair of legs extending at an angle to each other from said apex,

said first pair of legs adapted to cross over and engage said second pair of legs,

means for connecting said first pair of legs to said second pair of legs proximate the point of engagement,

means proximate each end of said outwardly extending first and second pair of legs distal said apex for respectively engaging said first and second support member.

4,535,963

HOLDER FOR RAILINGS, LISTS AND THE LIKE

Leif Lachonius, Surte, Sweden, assignor to Aktiebolaget SKF, Goteborg, Sweden

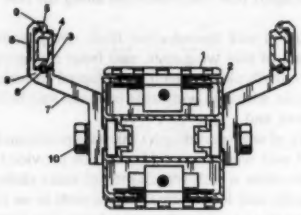
Filed Mar. 25, 1982, Ser. No. 361,569

Claims priority, application Sweden, Apr. 30, 1981, 8102745

Int. Cl.³ B65G *15/60*

U.S. Cl. 248—251 **1 Claim**

1. A holder for railings for a conveyor assembly including a frame in the form of a girder symmetrical about a horizontal plane and defining conveyor belt runs between opposing horizontal outer sides of said girder and having at opposite sides a pair of open longitudinally extending T-shaped channels, said channels having an entrance end in said horizontal outer side, said holder comprising a body adapted for mounting to the conveyor frame, said body having a shoulder which engages said entrance end and having an extension portion of U-shaped profile oriented so that the open end of said extension portion faces one of said conveyor belt runs, the confronting sides of said U-shaped profile being provided on one side with a boss intended to grip into the railing and on the other side with a



recess, and a locking pin which cooperates with said recess for arresting the railing to said holder, means for connecting said holder to the conveyor frame including a nut member engageable in said channels and a screw member engaging through said holder and cooperating with said nut member to secure said holder to said frame.

4,535,964

VIBRATION DAMPED SUSPENSION FOR A DRIVE AGGREGATE OF A MOTOR VEHICLE IN A BODY STRUCTURE

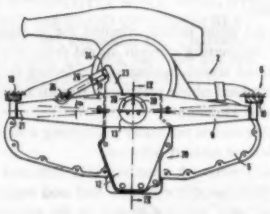
Matthias Schütz, Mundelsheim; Rolf V. Sivers, Rutesheim; Dirk Roesems, Nussdorf, and Rolf Rebmann, Stuttgart, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche A.G., Fed. Rep. of Germany

Filed May 4, 1983, Ser. No. 491,449

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217171

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—607 **23 Claims**



1. A vibration-damped suspension for a drive aggregate of a vehicle in a body structure comprising first bearing support means arranged in a forward area of the drive aggregate and further bearing support means arranged in a rear area of the drive aggregate, the further bearing support means including a cross bearer means for supporting an engine of the drive aggregate, dynamic decoupling means interconnecting the cross bearer means and a bracket means secured to said engine, said vibration damped suspension thereby retaining the engine in such a manner that the decoupling means permits relative movement of the vehicle body independently of and in a defined manner relative to the drive aggregate.

4,535,965

APPARATUS FOR MOLDING A PROFILED BODY

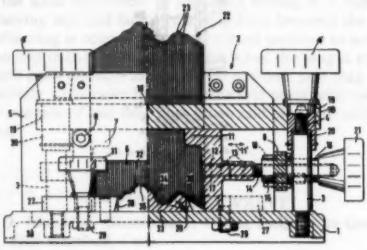
Alfred Dettelbach, Stuttgart; Gerhard Gresser, Oberboihingen, and Gerhard Einsele, Nuertingen, all of Fed. Rep. of Germany, assignors to Reich Spezialmaschinen GmbH, Nuertingen, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 597,932

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313650

Int. Cl.³ B29C *1/00, 1/14;* B29G *1/00*

U.S. Cl. 249—83 8 Claims



1. A molding apparatus for casting a molded body such as a grinding or polishing tool having at least one contoured surface complementary to a first profiled surface of a work piece to be ground or polished by said tool, comprising a base plate, side walls, a cover plate and two end walls facing each other for forming at least one molding cavity, each end wall having a hole therein, an elongated contouring insert member extending longitudinally through said holes in said end walls so as to pass longitudinally through said molding cavity, said contouring insert member having a second profiled surface corresponding to said first profiled surface of a work piece, and adjustable sealing means having at least one edge adjustable in its contour so that said one adjustable edge defines a contour substantially conforming to said second profiled surface of said insert member for sealingly closing each hole in said end walls, and wherein each said adjustable sealing means comprise a plurality of substantially planar sealing elements which are individually adjustable in their position relative to each other in a direction extending perpendicularly to said base plate, said molding apparatus further comprising means for adjustably mounting said sealing elements in said molding apparatus.

4,535,966

THROTTLE VALVE

Karl-Heinz Post, Kaarst, and Otwin Eich, Remscheid, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 422,968

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138345

Int. Cl.³ F16K *31/124*

U.S. Cl. 251—31 35 Claims

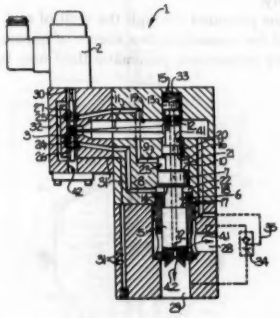
1. A hydraulic throttle valve comprising

a housing having a bore therein, with said bore having a closed inner end,

a hydraulic inlet channel and a hydraulic outlet channel, each communicating with said bore in said housing, and with one of said inlet and outlet channels including a valve seat which is coaxially aligned with said bore,

a piston rod mounting a choke piston adjacent one end thereof, said piston rod and choke piston being slideably mounted in said bore for movement between a closed position wherein said choke piston operatively engages said valve seat to close communication between said inlet and outlet channels, and an open position wherein said choke piston is axially withdrawn from said valve seat to permit such communication,

a differential piston mounted to said piston rod at a location axially spaced from said choke piston in a direction toward said closed inner end of said bore, and a blocking piston mounted to said piston rod at a location axially spaced from said differential piston in a direction toward said closed inner end of said bore, and such that a first chamber is defined within said bore between said choke piston and said differential piston and a second chamber is defined within said bore between said differential piston and said blocking piston, with the diameter of said differential piston being different from the diameter of said choke piston and different from the diameter of said blocking piston, such that a pressure within said first chamber acts to bias the choke piston toward one of either said open or closed positions and a pressure within said second chamber acts to bias the choke piston toward the other position,



control means for selectively biasing said choke piston toward one of either its closed or open positions, and including entry duct means for delivering a pressurized control fluid, first outlet duct means leading from said entry duct means to said first chamber, second outlet duct means leading from said entry duct means to said second chamber, and control valve means for providing selective communication between said entry duct means and either one of said first and second outlet duct means, whereby actuation of said control valve means results in the biasing of said choke piston toward either its open or its closed position, and

valve means operatively connected to each of said inlet channel and said outlet channel for operatively connecting at least one of said channels to said entry duct means of said control means, whereby the hydraulic fluid which flows through said channels serves as the pressurized control fluid of said control means.

4,535,967

EXPANDING GATE VALVE WITH FLUID-POWERED ACTUATOR

Brett A. Babbitt, Katy; Tri C. Le, Missouri City, and Bruce P. Noble, Lewisville, all of Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jan. 5, 1984, Ser. No. 568,460

Int. Cl.³ F16K *31/12*

U.S. Cl. 251—54 3 Claims

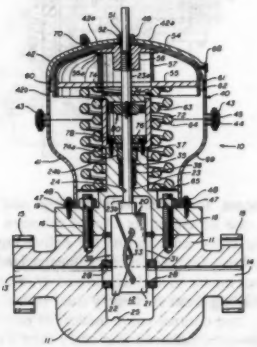
1. A gate valve structure having a valve body with a valve chamber therein and a flow passage extending through said valve body and communicating with said valve chamber, an expandable gate assembly mounted within said valve chamber for movement in a collapsed condition between open and closed positions with respect to said flow passage, said gate assembly including a gate element and a segment which are

expanded away from each other at said open and closed positions and are provided with ports which are aligned with one another and the flow passage in said open position, said gate element and segment being each provided with an outer planar sealing surface disposed parallel to one another for sealing against valve seats provided in said valve body at opposite sides of said gate assembly when the gate assembly is expanded in the open and closed positions, said valve body having a bore extending from the exterior of the valve body into said valve chamber;

pneumatic powered actuator means for moving said gate assembly transversely with respect to said flow passage between said open and closed positions, said actuator means comprising a housing mounted on said valve body and defining a piston chamber therewith;

a piston slidably received in the chamber, an actuator stem connected to said piston and movable therewith in the axial direction of said stem, said actuator stem extending through said bore and connected at one end to said gate assembly;

inlet means provided through the wall of said housing and adapted for connection to a source of pneumatic pressure whereby pressurized pneumatic fluid may be selectively



admitted to the chamber on one side of the piston for urging the piston in one direction therein from one of said open or closed positions to the other;

compression spring means in said chamber for continuously urging the piston in the opposite direction from said one direction; and

hydraulic choke means operably associated with said actuator stem for imposing a constant velocity control on said actuator piston substantially throughout the actuator stroke in both directions thereof for opening and closing the valve, said hydraulic choke means comprising a hydraulic cylinder mounted on said valve body in sleeved coaxial relation to said actuator stem, said actuator stem being adapted for axial reciprocal motion through said hydraulic cylinder, a hydraulic piston fixed to said actuator stem and mounted in said hydraulic cylinder for reciprocating motion therein, said hydraulic cylinder being filled with a hydraulic fluid, and means provided through said hydraulic piston for producing a throttling effect on the flow of hydraulic fluid from one side of the hydraulic piston to the other when said actuator piston is moved by pneumatic pressure or said spring means to thereby minimize the shock effect of the actuator stroke.

4,535,968

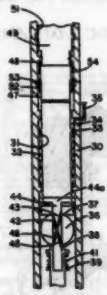
VALVE

John C. Gano, and Gary A. Kohn, both of Carrollton, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 16, 1983, Ser. No. 552,446

Int. Cl.³ F16K *31/12*

U.S. Cl. 251—58 **34 Claims**



1. A valve comprising,

a housing,

an actuator in the housing,

means for reciprocating the actuator,

a ball valve member and seat controlling flow through said housing,

means maintaining said ball valve member and seat together,

ball rotation means,

at least two cooperable track followers and tracks with the tracks lying in substantially a single plane and carried by one of the ball valve member and ball rotation means and the followers carried by the other of the ball valve member and ball rotation means,

one of said ball valve member and ball rotation means carried by and reciprocal with said actuator relative to the other of said ball valve member and ball rotation means and effecting simultaneous and continuous relative movement between said track and track followers and rotation of said ball valve member about substantially a single rotational axis between o,pen and closed positions.

4,535,969

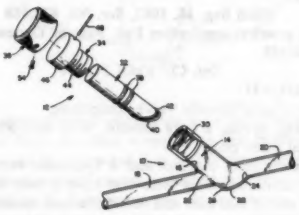
VALVE STRUCTURES

Larry T. Riley, Millville, N.J., assignor to Ace Glass Incorporated, Millville, N.J.

Filed Feb. 18, 1982, Ser. No. 349,756

Int. Cl.³ F16K *31/44*

U.S. Cl. 251—215 **14 Claims**



1. A valve structure comprising a valve housing defining a valve chamber with a cylindrical wall, means defining a first port in said cylindrical wall, means defining a second port in said cylindrical wall opposite said first port, whereby a fluid flow path extends between said ports, a cylindrical valve plug

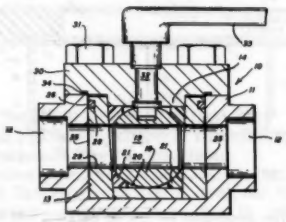
mounted in said chamber coaxially with said cylindrical wall for rotation about the axis of said cylindrical wall, means including cooperating threads on the valve chamber and the plug for providing axial movement of the plug in said valve chamber in conjunction with rotational movement of the plug about the axis of said cylindrical wall, said plug having an end portion with an end face inclined to said axis and having sealing means, including an elliptical seal extending peripherally around the plug adjacent to said end face, for isolating one port from the other when the plug is rotated to a closed position at which said end face of said plug is interposed between said ports, and for wiping said cylindrical wall as said plug is rotated, the axial movement of said plug beinng in a direction withdrawing said end face of the plug from between the ports when the plug is rotated from said closed position to an open position and in the opposite direction when the plug is rotated from said open position to said closed position, said plug being substantially withdrawn from between said ports with said end face at one side of said flow path when said plug is in said open position.

4,535,970

TOP ENTRY BALL VALVE

Jerry D. MacAfee, Glastonbury, Conn., assignor to Quamco, Inc., East Hartford, Conn.

Filed Dec. 27, 1983, Ser. No. 565,290
Int. Cl.³ F16K *43/00*
U.S. Cl. 251—315 **3 Claims**



1. A top entry ball valve comprising:

a first casing portion having a cylindrical bore extending downwardly from the top surface thereof and inlet and outlet passages extending horizontally therethrough and communicating with said vertical bore,

a second casing portion including

an upper cap portion having a bottom annular surface for matingly engaging with the top surface of said first casing portion and a downwardly projecting lower plug portion having

a pair or opposed vertical cylindrical surface means adapted to matingly engage with the surface defined by said downwardly extending bore in the first casing portion, and

a pair of opposed flat surfaces joining said opposed cylindrical surfaces and inclined inwardly downwardly towards each other, said flat surfaces extending substantially perpendicularly to said inlet and outlet passages,

a bore extending horizontally through said plug portion between said flat surfaces,

a ball having a bore therthrough and a pair of annular seats one either side of said ball located within said horizontal bore,

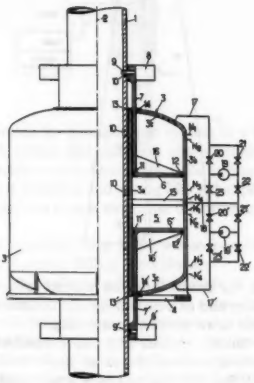
a pair of cheek elements each having one vertical cylindrical surface for matingly engaging with the surface defined by said downwardly extending bore in the first casing portion and a flat surface inclined inwardly downwardly for mating engagement with an inclined surface of said second casing portion, each of said cheek elements having a horizontal bore therethrough communicating with the flat surface thereof, and said inlet and outlet passages of said lower casing portion, the horizontal bore in each of said cheek elements and the horizontal bore in said plug portion being axially aligned.

4,535,971

PROPULSIVE-FORCE JACK INSTALLATION FOR PRODUCING THE CONTINUOUS MOVEMENT OF AN OBLONG OBJECT IN THE DIRECTION OF ITS AXIS, AND/OR FOR MOVING AN ELEMENT ALONG SAID OBJECT

Gilbert Laplante, La Croix Valmer, France, assignor to Compagnie Francaise d'Enterprises Metalliques, France

Continuation of Ser. No. 329,997, Dec. 11, 1981, abandoned.
This application Dec. 8, 1983, Ser. No. 559,017
Claims priority, application France, Dec. 16, 1980, 80 26697
Int. Cl.³ B66F *1/00*
U.S. Cl. 254—108 **8 Claims**



1. A propulsive-force jack apparatus for producing continuous movement of an oblong object in an axial direction and/or of an element along a said oblong object, said apparatus comprising at least two jack assemblies, each of which comprises a piston slidably movable in a corresponding jack body, locking means associated with the piston of each assembly for interlocking the pistons selectively, momentarily and automatically with the object, a device for supplying hydraulic fluid to said jack assemblies, and an automatic control means for controlling said locking means and for controlling supplying of said hydraulic fluid to, and the discharging of said hydraulic fluid from, said jack bodies such that engagement of said object by a said piston of one of said jack assemblies is effected in a continuous manner at the moment when the said piston of the other jack assembly is disengaged from said object and such that the relative movement of the piston of one assembly with respect to the piston of the other assembly is a synchronous seesaw movement, the offload movement of the piston of each of the jack assemblies being faster than the movement under load, effected in the opposite direction, of the piston of the other jack assembly, wherein each movement, under load, of said piston of each jack assembly is preceded by a short offload movement of the same piston in the same direction, said automatic control means comprising, for each jack assembly, a first sensor for detecting the arrival of the respective piston of the corresponding body at a position (N2, N2') situated just before the end (N1, N1') of the movement of that piston under load, said first sensor being connected, through an amplifier, to the said device for supplying hydraulic fluid to the jack assemblies responsive to detecting the arrival of said respective piston at said position such that this device automatically controls the beginning of an offload movement of the piston of one

of the other jack assemblies in the direction of movement of said object relative to said assembly at a moment which precedes the arrival at the end of travel in the same direction, of the piston under load.

4,535,972

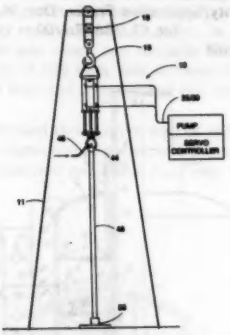
SYSTEM TO CONTROL THE VERTICAL MOVEMENT OF A DRILLSTRING

Keith K. Millheim, Terlton, and Tom M. Warren, Coweta, both of Okla., assignors to Standard Oil Co. (Indiana), Chicago, Ill.

Filed Nov. 9, 1983, Ser. No. 549,846

Int. Cl.³ B66C *1/00*

U.S. Cl. 254—277 **13 Claims**



1. A system for controlling the weight on a drill bit connected to a lower end of a drillstring and connectable to a drill rig having cable draw works, comprising:

at least one fluidic cylinder and piston assembly removably and operatively connected at an upper end thereof to a support of the drill rig and at a lower end thereof to a drillstring;

pump means for providing fluid to said fluidic cylinder and piston assembly;

valve means for controlling the flow of the fluid to and from said fluidic cylinder and piston assembly;

data measurement means, connected to the drillstring adjacent the drill bit, for generating a signal representative of the weight on the drill bit; and

computing means, in operative communication with said valve means for controlling the operation of the fluidic cylinder and piston assembly in response to the signal received from the data measurement means to maintain the weight on the drill bit within desired limits.

4,535,973

VEHICLE TIRE CARRIER

William C. Dorr, Jackson; Kenneth C. Hybarger, Belmont, and James A. Yurkinas, South Haven, all of Mich., assignors to Kent Products, Inc., Grand Haven, Mich.

Filed Jan. 11, 1984, Ser. No. 569,996

Int. Cl.³ B62D *43/04*

U.S. Cl. 254—323 **5 Claims**

1. A tire carrier winch for mounting to the underside of a vehicle for raising and lowering a spare tire between storage and access positions comprising, in combination, a housing, a driveshaft rotatably mounted upon said housing, a sheave rotatably mounted within said housing upon said driveshaft, a strand wound upon said sheave, an opening defined in said housing in substantial radial alignment with said sheave, said strand extending through said opening, a drive member connected to said shaft drivingly connected to said sheave upon rotation of said shaft, a drive member locking member within said housing shiftable between a lock position preventing rotation of said drive member and a drive member release position, and activating means connected to said locking member located adjacent said housing opening and engaging said strand adjacent said opening, said activating means shifting said locking member from said drive member release position to said lock position upon said strand being fully unwound from said sheave.

4,535,974

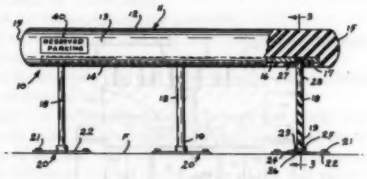
IMPACT ABSORBING PARKING SPACE BARRIER

Henry Conde, 359 English Oak Ct., Waldorf, Md. 20601

Filed Apr. 12, 1984, Ser. No. 599,140

Int. Cl.³ E04H *17/00*

U.S. Cl. 256—1 **12 Claims**



12. A barrier apparatus for use in parking lots having surfaces defined by generally parallel parking spaces comprising an elongated generally horizontally extending rail means having inner and outer portions, first and second ends and oppositely disposed elongated sidewall portions, said inner portion of said rail means being defined by an elongated core means and said outer protion being a generally resilient material which is carried by said core so that said sidewall portions have an outer surface formed of an impact absorbing material, at least two generally vertically extending horizontally spaced post means having first and second end portions, a base means engageable with the surface of the parking lot, said first end portion of said post means being connected to said base means, and said second ends of said post means being removably secured to said core means of said rail means whereby said elongated rail means may be selectively disposed in general parallel relationship between two adjacent parking spaces in an elevated position with respect to the parking lot surface.

4,535,975

GAS-TRANSMITTING WALL ELEMENT FOR A METALLURGICAL VESSEL, A METALLURGICAL VESSEL HAVING SUCH A WALL ELEMENT, AND A METHOD OF PRODUCING STEEL

Gerardus P. Bührmann, Velsen-Zuid, and Adam Steen, Heemskerk, both of Netherlands, assignors to Hoogovens Groep B.V., Ijmuiden, Netherlands

Filed Nov. 9, 1982. Ser. No. 440,401

Claims priority, application Netherlands, Nov. 18, 1981, 8105221

Int. Cl.³ C21C *5/34*

U.S. Cl. 266—220 **9 Claims**

1. Gas-transmitting wall element for a converter for steel

making having a refractory lining composed of bricks, the element comprising a metal box having a base and side walls, a gas inlet opening in said box adjacent said base and a refractory filling in said box composed of at least one refractory element, said refractory element being an unfired pressure moulded brick made of refractory particles and binder, the filling being

spaced from the said base of the box and having faces contacting the side walls of the box and grooves in said faces for passage of the gas extending from the end of the element(s) adjacent the base to the opposite end thereof, said wall element having the same shape as one or more bricks in the region of the lining adjacent the wall element.

4,535,976

RUBBER VIBRATION ISOLATORS

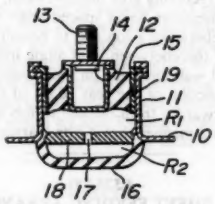
Takuya Dan, and Akio Fujita, both of Yokohama, Japan, assignors to Bridgestone Tire Co., Ltd., Japan

Continuation of Ser. No. 274,568, Jun. 17, 1981, Pat. No. 4,424,960. This application Aug. 17, 1983, Ser. No. 524,188

Claims priority, application Japan, Jun. 23, 1980, 55-84773; Jul. 12, 1980, 55-94565

Int. Cl.³ F16F 9/10

U.S. Cl. 267—8 R **1 Claim**



1. A rubber vibration isolator comprising: an inner sleeve, an annular rubber elastomer, an annular metal ring body and a metal outer sleeve; said annular rubber elastomer being inserted between said inner sleeve and said annular ring body and integrally bonded to both said inner sleeve and said annular ring body, said rubber elastomer provided at its outer circumference with plural recesses separated from each other by said rubber elastomer, and said annular ring body being fitted into said outer sleeve so as to form a metal contact therebetween and being provided with plural holes corresponding to said recesses and with fine grooves formed in the outer periphery thereof by cutting to define restricted passages together with the inner surface of said outer sleeve establishing communication between said holes and between said recesses, and said recesses, holes and fine grooves being filled with an incompressible liquid.

4,535,977

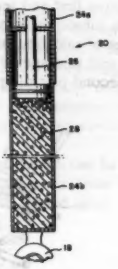
APPARATUS AND METHOD FOR A SUSPENSION SYSTEM

John R. Strong, King County, Wash., assignor to Paccar Inc., Bellevue, Wash.

Continuation of Ser. No. 285,584, Jul. 21, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 572,965

Int. Cl.³ F16F 9/06

U.S. Cl. 267—64.15 **14 Claims**



1. An apparatus for a suspension system in a vehicle which provides both spring and damping characteristics in a single unit, the apparatus acting like a pneumatic spring for a pressure change of short duration and acting like a damper for repeated pressure oscillations over a moderate time frame, the apparatus comprising:

(a) a closed container that has a variable volume;

(b) a liquid partially filling the volume;

(c) a gas in the volume which is soluble in the liquid, but which is supplied in excess to form a gas-liquid interfacial system, wherein the liquid is saturated with the gas under static conditions, the solubility of the gas in the liquid increasing with an increase in temperature in a manner that substantially counters the volume change of the gas due to the increased temperature, thereby substantially maintaining constant the static height of the closed container over an operating range of temperatures;

(d) a foam on which the liquid is capable of forming a film substantially filling the volume and holding the liquid in a film over at least a portion of the foam so that the surface area of the liquid in contact with the gas is greater than the cross-sectional area of the container; and

(e) means for connecting the container into the suspension in the vehicle to provide spring and damping characteristics for the vehicle by the gas compressing or by the gas entering or leaving solution with the liquid.

4,535,978

COIL SPRING AND SPRING ASSEMBLY

Robert F. Wagner, Lombard, Ill., assignor to Sealy, Incorporated, Chicago, Ill.

Continuation of Ser. No. 142,851, Apr. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 923,771, Jul. 12, 1978, abandoned. This application Nov. 16, 1981, Ser. No. 321,798

Int. Cl.³ F16F 1/12

U.S. Cl. 267—91 **15 Claims**

1. A spring assembly for an innerspring unit comprising:

a plurality of spiral coil springs arranged in a plurality of substantially parallel rows, each of said coil springs having opposed terminal convolutions, said opposed terminal convolutions forming first and second opposed surfaces of the assembly, said terminal convolutions including first terminal convolutions and second terminal convolutions;

said coil springs including a plurality of first coil springs each having a first terminal convolution and a plurality of second coil springs each having a second terminal convolution, said first and second coil springs being disposed adjacent each other in the same row and said first and

second terminal convolutions being disposed in the first surface of the assembly;

said first and second terminal convolutions each comprising a first and a second offset segment, each offset segment lying in the plane of its respective terminal convolution and each having a base and an apex, said base being formed of two legs diverging from said apex, and said terminal convolutions being disposed, so that the offset segments of said first terminal convolution overlie the offset segments of said second terminal convolution such that the respective first and second offset segments lie in opposed planes substantially parallel to the first surface, and said apexes of said first offset segments form a first pair of apexes and said apexes of said second offset segments form a second pair of apexes;

said bases of said first and second offset segments of each of said first and second terminal convolutions being disposed in an alignment transverse said rows of coil springs, and said first and second pairs of apexes being disposed on opposite sides of said alignment; and

a cross helical, directly interconnecting the offset segments of said first and second terminal convolutions with one another, said offset segments and said cross helical substantially by themselves cooperating together to allow substantially unrestricted pivotal movement between said first and second terminal convolutions to a desired maximum angle upon compressive movement of said first coil spring by a load applied at the first surface of the assembly toward the second surface of the assembly, and to prevent said pivotal movement beyond said desired maximum angle upon further compressive movement of said first coil spring by said load.

4,535,979

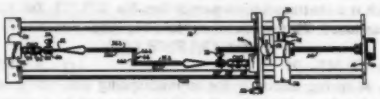
ALIGNMENT TOOL FOR PIECE WORK

James Paarmann, R.R. 2, Box 1, Girard, Kans. 66743

Filed Jan. 9, 1984, Ser. No. 569,305

Int. Cl.³ B25B *1/20*

U.S. Cl. 269—45 **7 Claims**



1. A tool for aligning two work pieces, said tool comprising:

a rigid framework presenting an elongate guide structure having a substantially horizontal orientation to define a first horizontal axis;

a first elongated arm mounted on said framework at a location above said guide member, said first arm having means for holding one of the work pieces;

stanchion means extending upwardly from said guide structure and mounted thereon for linear movement along the length thereof to travel along said first axis generally toward and away from said first arm;

a first bracket mounted on said stanchion means at a location above said guide structure for movement along same with the stanchion means, said first bracket presenting a second axis oriented perpendicular to said first axis;

a second bracket mounted on said first bracket for linear movement relative thereto along said second axis, said second bracket presenting a third axis oriented perpendicular to both said first and second axes;

a second elongated arm having means for holding the other work piece; and

means for mounting said second arm on said second bracket for linear movement relative thereto along said third axis.

4,535,980

LOG HOLDER FOR USE IN SPLITTING LOGS

Ross W. Jordan, 1627 Gist Rd., Cloquet, Minn. 55720

Filed Dec. 21, 1983, Ser. No. 563,992

Int. Cl.³ B23Q *3/02*

U.S. Cl. 269—102 **7 Claims**

1. A log holder for holding a log in a position to facilitate splitting a log and retaining the split pieces, said log holder comprising:

two wall members of sheet metal;

ground engaging means in the form of an angle iron; and

means for detachably securing said sheet metal wall members at their rear edges to the flanges of said angle iron so that said wall members extend perpendicularly to each other, diverging from their rear to their front edges to form a log receiving area therebetween, the front edges of said wall members being spaced apart sufficiently to receive therebetween a log and to permit an axe handle to pass freely therebetween, said angle iron supporting said sheet metal wall members on the ground at such an angle that the junction of the rear edges of the wall members slopes rearwardly from bottom to top so as to support a log in such a manner that it tilts rearwardly.

4,535,981

PAPER SHEET FEEDING ARRANGEMENT

Yutaka Watanabe, Nakano, and Fumio Fukumoto, Sagamihara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 8, 1983, Ser. No. 549,815

Claims priority, application Japan, Nov. 16, 1982, 57-201383

Int. Cl.³ B65H *3/52*

U.S. Cl. 271—121 **6 Claims**

1. In a paper sheet feeding arrangement for feeding paper sheets, one sheet by one sheet, from a stack of the paper sheets, which comprises a paper feeding roller contacting the paper sheet and driven for rotation in a paper sheet feeding direction and a paper sheet separating member held in pressure contact by said paper feeding roller for preventing the paper sheet fed by said paper feeding roller from advancing so as to feed only the paper sheet contacting the paper feeding roller by passing between said paper feeding roller and said paper sheet separating member, the improvement comprising;

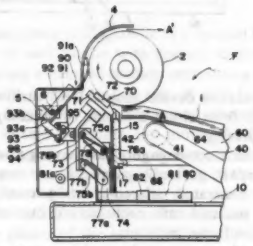
(a) means for holding the stack of paper sheets movably in a direction approximately at right angles with respect to the feeding direction of the paper sheets between a first position where the stack of paper sheets confronts said paper feeding roller and a second position where the stack of paper sheets is spaced from said paper feeding roller,

(b) a pushing member pivotally provided so as to be capable of pushing back the paper sheet located between the paper feeding roller and the paper sheet separating member towards the stack of paper sheets through pivotal movement thereof,

(c) a first biasing means for urging said pushing member to be pivoted in a direction of the pushing back,

(d) a stopper means for stopping said pushing member at a stand-by position for the pushing back against the urging force of said first-biasing means,

(e) a second biasing means for urging the holding means in a direction towards said second position when said holding means is in said first position,



(f) a locking means for locking said holding means at said first position against the urging force of said second biasing means,

(g) a lock releasing means for releasing said locking means from the locked state. and

(h) an associating means which is associated with said lock releasing means so as to release said paper sheet separating member from the pressure contact with respect to said paper sheet feeding roller, and also to release said stopper means from stopping said pushing member, said associating means functioning to associate said paper sheet separating member, said stopper means and said locking means with each other so as to effect the releasing in such order as the releasing of the pressure contact of said paper sheet separating member, releasing of stopping of the pushing member by said stopper means, and releasing of locking of said holding means by said locking means following the functioning of said lock releasing means.

4,535,982

SHEET FEEDING CASSETTE LATCHING SYSTEM

Hideaki Mochimaru, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Feb. 1, 1984, Ser. No. 575,884

Claims priority, application Japan, Feb. 1, 1983, 58-13767; Feb. 7, 1983, 58-17424; Feb. 10, 1983, 58-17445; Apr. 4, 1983, 58-49891

Int. Cl.³ B65H *1/08*

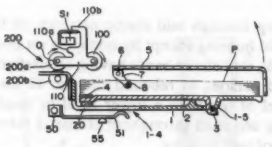
U.S. Cl. 271—127 **4 Claims**

1. A sheet feeding cassette latching system capable of latching a sheet feeding cassette on to a main body of a copying apparatus and the like and unlatching same comprising a sheet support plate pivotally supported at a rearward end portion thereof by a bottom plate of the cassette, and an upper cover capable of being opened and closed as a rearward end thereof is flipped upwardly even when the cassette is in a latched position, said sheet support plate being pivotally moved upwardly by a lifter of the main body when the cassette is inserted into the latched position to bring the uppermost sheet of a stack of sheets supported on the sheet support plate into pressing engagement with sheet feeding means of the main body to feed one sheet after another to a copying station, such system comprising:

engaging members engageable with each other located at a forward end portion of the cassette at opposite sides thereof and a cassette receiving section of the main body, said engaging members being operative to allow the cassette to be moved into and out of the cassette receiving section in a tilting position in which a rearward portion of the cassette is disposed at a higher-than-normal level while the cassette is in the process of being inserted into or withdrawn from the cassette receiving section and enable the cassette to move downwardly to the latched position when it has reached a predetermined position;

a sheet support plate lifter drive source for moving said lifter upwardly;

power transmission means which can be engaged and disengaged for transmitting power from said sheet support plate lifter drive source to said lifter;



engaging and disengaging means for engaging and disengaging said power transmission means; and

an actuating member for actuating said engaging and disengaging means by being brought into engagement therewith;

wherein said sheet support plate lifter drive source, power transmission means and engaging and disengaging means are located at the main body while said actuating member is located at the cassette and said actuating member is operative in conjunction with both the operation of opening the upper cover of the cassette and the operation of tilting the cassette when the cassette is to be unlatched to cause the engaging and disengaging means to bring the power transmission means to a disengaged condition so that the lifter and the sheet support plate of the cassette can be moved by gravitational pull from the sheet feeding position and the sheet feeding means is brought out of engagement with the uppermost sheet of the stack of sheets when there are sheets on the sheet support plate or a top surface of the sheet support plate when there are no sheets thereon.

4,535,983

RECREATIONAL DEVICE FOR PRODUCING THE THRILL OF A FREE FALL

Alfonso De-La-Concha-Caceres, Mexico City, Mexico, assignor to Free Motion Designs Corporation, Houston, Tex.

Filed Apr. 14, 1983, Ser. No. 484,997

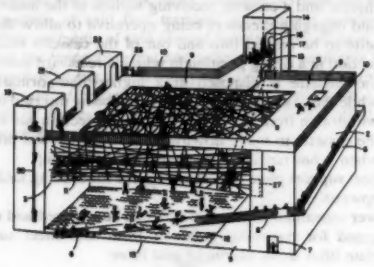
Claims priority, application Mexico, Apr. 15, 1982, 192281; Mar. 23, 1983, 196685

Int. Cl.³ A63G *31/00*

U.S. Cl. 272—6 **13 Claims**

10. A recreational device for producing the thrill of a free fall on the users and comprising in combination a housing having a bottom, tall side walls and an open top, a shock absorbing cushion extending throughout the area of the bottom of said housing, an inwardly extending peripheral deck located at the open top of said housing, said deck having an area sufficient to accommodate a predetermined number of persons and including a launching area for allowing said persons to jump into said housing, and a plurality of elastic bands having their two opposite ends fixedly attached to the interior surfaces of

the side walls of said housing, each individual elastic band extending in a horizontal position throughout its length across said housing, said elastic bands being randomly arranged at different levels within said housing to form an elastic network leaving spans between said bands which are sufficiently small to prevent a person jumping from said deck into said housing



from passing through said elastic network all the way down through said housing except by bouncing on one or more said elastic bands, said elastic bands having an elasticity sufficient to permit said persons to rebound thereon as they fall from a higher level of bands to a lower level of bands, said elastic bands being arranged throughout at least a substantial part of the height of said housing.

4,535,984

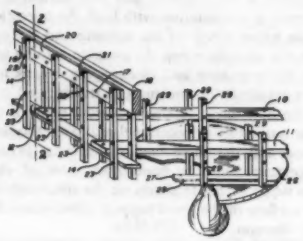
SUPPORT APPARATUS

James B. Landsverk, 6893 8th St. North, St. Paul, Minn. 55119

Filed Jul. 21, 1983, Ser. No. 515,778

Int. Cl.[3] A63B *69/00*; A47F *5/08*

U.S. Cl. 272—78 **7 Claims**



6. Support apparatus comprising:

a. parallel spaced apart first and second elongated horizontal base track means of uniform cross-section throughout the entire length thereof, said base track means being fixedly mounted to overhead ceiling means,

b. first and second track follower assemblies adjustably mounted respectively to said first and second base track means, each said track follower assembly including elongated horizontal mating track means of uniform cross-section throughout the entire length thereof, said mating track means being substantially equal in length to said base track means and being slidable in aligned relationship with respect to said base track means and supported by said base track means in said aligned relationship, means for maintaining said mating track means against tilt elevational movement with respect to said base track means, and at least two strut means affixed to each said mating track means in vertically depending relationship therefrom and in spaced relationship along the length thereof, and

c. a suspended horizontal platform assembly adjustably fixed to and supported by said strut means.

4,535,985

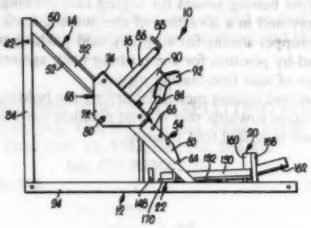
POWER HIP, HACK SQUAT AND LEG EXERCISE SLED

Ernest D. Mask, 311 Marion La., Lee's Summit, Mo. 64063

Filed Jul. 19, 1983, Ser. No. 515,302

Int. Cl.[3] A63B *21/00*

U.S. Cl. 272—134 **15 Claims**



1. A leg exercise device adaptable to various sized athletes and operable from either a supine or squating position, said device comprising:

an elongated, floor-engaging base having a pair of elongated, spaced-apart, generally parallel frame members;

a pair of elongated, spaced-apart, generally parallel, upwardly inclined rails each having one end affixed to a respective frame member;

an elongated cross beam located between and in generally spanning relationship to said rails;

means mounting said cross beam between said rails and adjacent the ends of said rails remote from said frame members for permitting slight lateral movement of said rails;

an elongated weight-receiving unit transversely oriented relative to said rails, means adjacent each end of said unit for slidably mounting said unit on said pair of rails;

a unit positioning mechanism mounted on at least one said pair of rails proximate to the end thereof, said mechanism including an upwardly extending stop secured to of said pair of rails one rail, an elongated block movably disposed atop said one rail and presenting a contact face at one end thereof, and structure defining a plurality of openings in said block along the length thereof for alternately receiving said stop whereby said block can be selectively positioned along one rail of said pair of rails by the selective reception of said stop in one of said openings, thereby adjustably positioning said block contact face atop said one of said pair of rails for abutting engagement with said weight-receiving unit;

a flat bench located generally between said frame members; and

means adjustably securing said bench between said frame members for selective shifting of the bench along the length of said frame members,

said bench being shiftable from a normal power hip exercise position supporting the athlete in supine disposition with the athlete's feet raised and engaging the weight-receiving unit, to a stowed location allowing the athlete to assume power leg or hack squat exercise positions,

said bench having an elongated, flattened, removable portion including means adjacent one end of said portion for selectively and operably attaching said portion to said weight-receiving unit and for supporting the athlete in the hack squat exercise position,

said unit positioning mechanism and said adjustable bench thereby cooperating for selective accommodation of various sized athletes in either the supine or squating position and said laterally movable rail other ends serving to com-

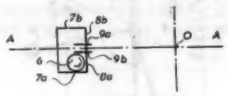
pensate for strength differences between the respective legs of a user.

4,535,986

INCLINATION SIGNALING DEVICE ON A TENNIS RACQUET

Camille Richards, 18 Avenue Emile Deschanel, Paris, France (75007)

Filed Sep. 16, 1982, Ser. No. 418,968
Claims priority, application France, Sep. 30, 1981, 81 18435
Int. Cl.³ A63B *49/08, 69/38*
U.S. Cl. 273—29 A **4 Claims**



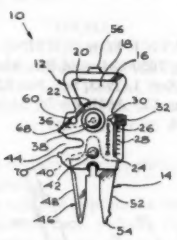
1. A device mounted in the handle of a racquet for signaling the inclination of said handle with respect to the horizontal, said racquet having a stringed surface, comprising an enclosure symmetrical with respect to the axis of said handle having dihedrals each formed by two juxtaposed planes on which a ball contained in said enclosure can move, the first plane of each dihedral being arranged along the axis of the handle and perpendicularly to the plane of said surface of the racquet, the second plane of each dihedral forming a maximum angle of 90° with said axis and said first plane, and comprising an electrical contact on the planes of the two dihedrals directed towards said stringed surface, said electrical contact being arranged substantially along said axis and being connected to signaling means, whereby said ball is projected onto said electrical contact under the effect of the centrifugal force in the course of play by rolling over said second plane of one of each dihedral and provides a signal provided the axis of the racquet is dipped downwards.

4,535,987

GOLF TOOL

Joseph K. Dikoff, P.O. Box 4553, Christiansted, St. Croix, V.I. 00820

Filed Aug. 22, 1984, Ser. No. 643,154
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—32 B **1 Claim**



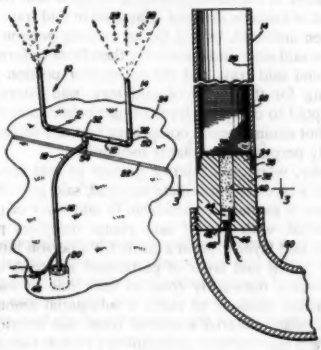
1. A golf tool including:
a main carrier element;
an ancillary carrier element pivotably connected by a first pivot to said main carrier element;
said ancillary carrier element having a pair of tapered leg portions each terminating, at its end remote from said first pivot, in a narrowed region and each having increasing spacing from the other as each of said narrowed regions is approached;
one of said leg portions carrying pointed means for cleaning the faces of golf club heads;
said main carrier element carrying along its periphery a protuberance having a screwdriver-like tip;
said main carrier element including, in addition, a region having a trapezoidally shaped opening therein sized to engage and remove caps from bottles; and,
mechanical snap means carried by said main carrier element for mechanically and releasably holding a ball marker;
said main carrier element having along the periphery thereof, in addition to said protuberance having a screwdriver-like tip, means for coupling to golf-shoe cleats for the removal of such cleats from golf shoes.

4,535,988

FOOTBALL GOAL POST WITH EXPLOSIVE-TYPE SOUVENIR PROJECTOR

Norman G. Foley, Rte. I, Box 30, Matoaka, W. Va. 24736

Filed Aug. 26, 1982, Ser. No. 412,524
Int. Cl.³ A63B *67/00*
U.S. Cl. 273—55 D **1 Claim**



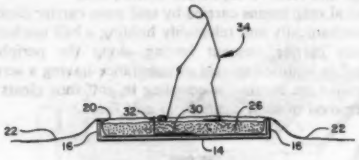
1. In combination with a football goal post comprising a horizontal cross bar and a pair of vertically disposed tubular members of equal length oriented at the ends of the cross bar, said cross bar and tubular members being constructed of tubular pipe and a pipe fitting interconnecting the cross bar and the vertical tubular members, that improvement comprising a substantially solid breech block inserted between the lower end of at least one tubular member and the pipe fitting with the breech block being screw-threadedly connected to the pipe fitting and the lower end of the tubular member thereby becoming a part of the football goal post, said breech block including a cavity communicating with the upper end thereof receiving an explosive charge for detonation and discharging expanding gases and products of combustion into the lower end of the tubular member, a plurality of thin, substantially flat, imperforate, lightweight discs oriented in a vertical stacked independent relation in the tubular member with the lowest disc supported against the upper end of the breech block whereby detonation of the explosive charge in the breech block will eject the stack of discs upwardly and out the upper end of the tubular member without rotation for discharge of the discs in a random pattern over a relatively large area around the goal post, said tubular member being in the form of a pipe having a generally circular cross-sectional configuration with the discs closely but loosely fitting the interior of the tubular member for ejection of the discs at a relatively high velocity for dispersal over a large area to provide many spectators at a football game with the opportunity to obtain one of the discs, said discs including indicia relating to a football game, said breech block having an external periphery similar to the external periphery of the tubular member.

4,535,989

SAND TRAP PRACTICE DEVICE

Arthur Lovin, 2609 Petaluma Ave., Long Beach, Calif. 90815

Filed Jun. 7, 1984, Ser. No. 617,960
Int. Cl.[3] A63B 69/36
U.S. Cl. 273—176 FB 14 Claims



1. Apparatus for the practice of golf shots, comprising:

a tray having a planar bottom and substantially vertical sides, the horizontal dimensions of said tray being large enough to allow a person to stand in said tray and swing a golf club therein, and the height of said sides being small relative to the horizontal dimensions of said tray;

a sheet of foldable material contained in said tray, said sheet, when unfolded, having (a) an exterior portion extending over said sides and outwardly therefrom to form an apron around said tray, and (b) an interior portion forming a lining for the inside of said tray, said interior portion adapted to contain a layer of particulate material; and

golf shot aiming means, comprising first and second substantially perpendicular planar members;

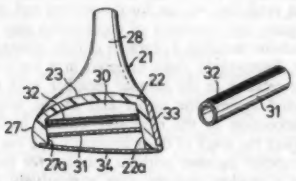
whereby, when said interior portion of said sheet is filled with a layer of particulate material, said golf shot aiming means is partially embeddable in said layer of particulate material, with one of said planar members protruding from said layer to form a guide for a person hitting a golf ball out of said layer of particulate material, said apron extending outwardly from at least one of said sides a sufficient distance to catch a substantial amount of the particulate material scattered from said interior portion toward said one side as a result of a person swinging a golf club into said particulate material.

4,535,990

GOLF CLUB HEAD

Magoichi Yamada, Tokyo, Japan, assignor to Daiwa Golf Co., Ltd., Kurume, Japan

Filed Nov. 17, 1983, Ser. No. 552,757
Claims priority, application Japan, Nov. 24, 1982, 57-177367[U]; Feb. 26, 1983, 58-27875[U]
Int. Cl.[3] A63B 53/04
U.S. Cl. 273—173 1 Claim



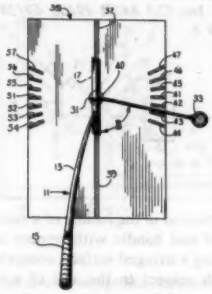
1. A golf club head formed of fiber reinforced plastic in which there is a cavity surrounded with portal shaped walls formed by a face part, a top part and a back part of the head body and provided at the rear of the impact face, characterized by arranging a tubular reinforcement material formed of plastics including reinforcement fibers and disposed, abutting at its both ends on the inner walls of the face part and of the back part, so as to span between them; and a face plate made of fiber reinforced plastics and fixed at the front of the face part wall of the head body.

4,535,991

ISOMETRIC GOLF TRAINER DEVICE AND METHOD

Edward Boatright, 1805 Lawrence, Springdale, Ark. 72764

Filed Nov. 7, 1983, Ser. No. 548,951
Int. Cl.[3] A63B 69/36
U.S. Cl. 273—193 A 3 Claims



1. An isometric training device for golfers comprising

a shaft between 36 and 48 inches long having a longitudinal axis,

a handle at the top of said shaft,

an elongated head rigidly secured at the bottom end of said shaft at an angle of from 115° to 135° thereto, said head being formed of substantially rigid, inflexible material and extending from said shaft,

a substantially inextensible tie element for connecting said head to a stationary object near floor level, said tie element having an extensibility of less than 1 inch for 10 pounds force, and

means for securing said tie element to said head at selectively different fixed distances from the axis of said shaft including a first opening in the rigid material of said elongated head spaced from said shaft axis a predetermined distance and a second opening in said rigid material spaced a lesser distance from said axis than said first opening,

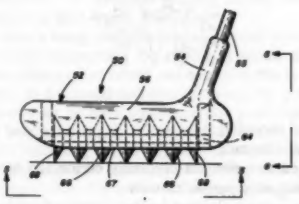
whereby the torque transmitted to said shaft through said elongated head may be adjusted for different isometric training procedures.

4,535,992

TRAINING DEVICE FOR PUTTING GOLF BALLS

Frederick A. Slagle, 7050 Griswold Rd., Madison, Ohio 44057

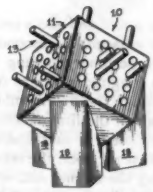
Filed Sep. 1, 1983, Ser. No. 527,951
Int. Cl.[3] A63B 69/36, 53/04
U.S. Cl. 273—194 A 6 Claims



1. A training device of the type adapted for use for putting a golf ball, said device including a putting head and which

mounts a shaft adapted to carry a handle for putting the golf ball, said putter head including an elongated cavity which opens onto the bottom surface thereof, a reel assembly including a reel member disposed for rotational movement within said cavity, said reel member including a plurality of axially spaced disc elements having ground engaging surfaces, each of said disc elements including a substantially circular body having tapered side surfaces which extend outwardly and inwardly so as to imerge into a peripheral apex edge surface adapted for a substantially line-contact tracking action with the putting surface, said disc elements being defined also by unitary, radial spacer members which provide generally inverted, frusto-conical grooves between adjacent of said disc members, with said peripheral apex edge giving a line-contact across the putting surface to maximize the tracking ability of the putter head to insure a straight in-line back and forward putting stroke.

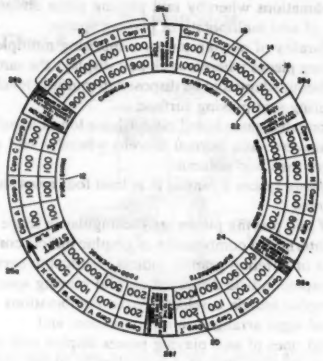
4,535,993
PUSH PEG GAME APPARATUS
John Topits, P.O. Box 1593, Coos Bay, Oreg. 97420
Filed May 31, 1984, Ser. No. 615,651
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—241 **14 Claims**

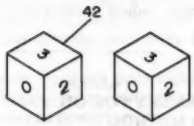


1. A push peg game apparatus comprising
a block of material formed into a geometric configuration having at least three distinct playing surfaces, wherein each of said distinct playing surfaces is provided with an equal number (n) of a plurality of apertures and each aperture defines the opening of an elongated hole formed in the block of material, wherein the elongated holes extending from the at least three distinct playing surfaces intersect one another at an angle of α; and
a plurality of elongated pegs divided into at least three distinct groups of pegs, wherein the number (m) of pegs in each group is less than the number (n) of apertures in each distinct playing surface.

4,535,994
BOARD GAME APPARATUS
William P. Cowan, 118 Chapel Hill Dr., Brentwood, N.Y. 11717
Filed Apr. 21, 1983, Ser. No. 487,101
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—256 **7 Claims**

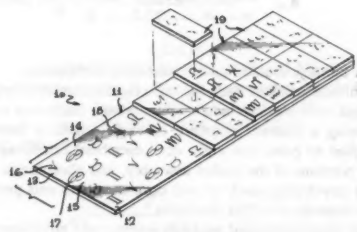
1. A business and finance game apparatus for play by two or more players comprising:
a game board on which is imprinted a track having an inner and outer circumference, radially divided into several industry segments each of which is radially subdivided into several corporation spaces each corporation space designated with the name of the corporation, and an income and price per share number for each corporation, each segment being separated by a single situation space which allows the player the opportunity to buy and sell shares at the price per share which corresponds to the price per share number on the corporation space, collect income, pay off loans and pay taxes;
a plurality of bank notes;
a set of ten corporate shares corresponding to each corporation space, bearing the same price per share number that appears on the corporate space;
two or more playing pawns employed to designate movement of the player around the board; and
means for simultaneously governing movement of said playing pawn around the board and directing the maximum





number of shares of a corporation a player may purchase upon landing on a corporation space, said means comprising a pair of dice each die bearing on each face a different single number from zero to five wherein the sum of the top exposed die faces corresponds to the maximum number of shares which can be purchased on the landing.

4,535,995
GAME APPARATUS
Gordon E. Warnick, 11837 Laurelwood Dr., Studio City, Calif. 91604
Filed Sep. 19, 1983, Ser. No. 533,242
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—273 **1 Claim**



1. In a game board apparatus to be played by a single person comprising the combination of:
an elongated game board having a playing surface permanently displaying a multiplicity of playing spaces arranged in parallel rows and parallel columns;
said playing surface characterized as being borderless;
each of said playing spaces displaying given combinations of a pair of different graphic indicia;

a plurality of playing pieces, each of which displays permanent predetermined combinations of graphic indicia on one single surface only of each piece identical to said combinations of graphic indicia displayed on said game board;

said playing piece graphic indicia adapted to correspond by matching with selected ones of said playing space given combinations whereby said playing piece covers at least two of said multiplicity of playing spaces;

said plurality of playing pieces comprising multiple pairs of playing pieces wherein each pair displays the same indicia and being adapted to be disposed in multiple levels or tiers covering said playing surface;

said elongated game board establishes a longitudinal axis and a transverse axis normal thereto whereby said rows are longer than said columns;

said playing spaces arranged in at least four rows and twelve columns;

each of said playing pieces are rectangular in shape and said predetermined combination of graphic indicia constituting a pair of different graphic indicia identical to certain pairs of graphic indicia displayed on said playing spaces;

said graphic indicia is selected from combinations of astrological signs arranged in a progression; and

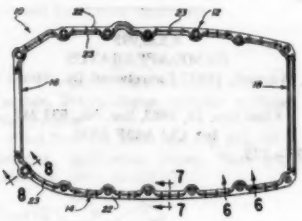
seclected ones of said playing pieces display said predetermined graphic indicia longitudinally along the length thereof and other playing pieces display said predetermined graphic indicia transversely across the length thereof.

4,535,996

GASKET ASSEMBLY FOR OIL PANS AND THE LIKE AND METHOD OF MAKING SAME

James C. Cardis, Chicago, and Josefino T. Inciong, Des Plaines, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.

Filed Jan. 18, 1985, Ser. No. 692,507
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—1 **21 Claims**



1. A unitary, molded gasket assembly comprising

a pair of side sections, each having a rigid assembly comprising a rigid core member and stop members, each stop member defining a fastener aperture through which a fastener is adapted to pass, said rigid core members extending along side portions of the gasket assembly, and elastomeric envelopes enveloping each of said core members and providing side sections of a first thickness,

integral elastomeric end portions joining said envelopes,

said stop members being hard, rigid, and high-temperature resistant, and being secured in said gasket assembly, said stop members being of a second thickness less than said first thickness,

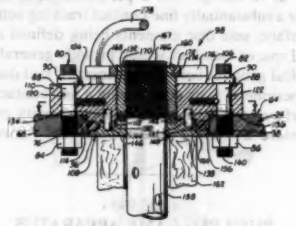
whereby when said gasket assembly is disposed to be compressed between elements to be sealed, said stop members limit compression thereof and limit displacement of said elastomeric envelopes to prevent splitting of said elastomeric envelopes.

4,535,997

SEALING SYSTEM

John E. Brust, 2600 NE. Loop 410 #3401, San Antonio, Tex. 78217

Division of Ser. No. 507,331, Jun. 24, 1983, Pat. No. 4,522,717.
This application Feb. 1, 1985, Ser. No. 697,144
Int. Cl.³ F16J *15/46*; B01D *27/00*
U.S. Cl. 277—102 **6 Claims**



1. A sealing system for effecting a seal between a sealing surface defined by the internal periphery of a circular aperture and an object disposed at least partially in said aperture, comprising:

said object comprising:

a first member having a first end and a second end, portions of the first member adjacent the second end thereof having a cicular outer periphery mating with said sealing surface, wherein a longitudinal bore threaded in a first sense is formed through the first member to intersect the first and second ends of the first member; and

a second member disposed in said aperture adjacent the second end of the first member, the second member having a first end facing the second end of the first member and abuttable therewith, the second member having a circular periphery mating with said sealing surface, and the second member having a projection externally threaded in a second sense opposite said first sense extending coaxially into the bore through the first member, wherein a shoulder is formed in the periphery in one of the first and second members at the end thereof abuttable with the other member, said shoulder extending circumferentially about portions of such member to define a groove in the periphery of the object when the first end of the second member is abutted with the second end of the first member;

a tubular coupling having external threads to mate with the threads in the bore of the first member and internal threads to mate with the threads on the projection on the second member, the coupling screwed into the bore of the first member and onto the projection on the second member;

indexing means for preventing relative rotation of the first and second members, whereby the tubular coupling can be turned in one direction to separate the members and turned in the opposite direction to draw the members into abutment; and

an elastomeric sealing ring disposed in said shoulder to extend circumferentially about the object.

4,535,998

SEALING DEVICE FOR HYDRAULIC ENERGY DISSIPATOR OF THE TELESCOPIC TYPE

Maurice Katz, Paris, France, assignor to Creusot-Loire, Paris, France

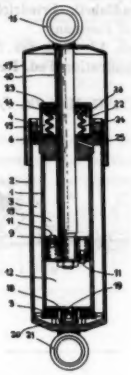
Filed Feb. 14, 1984, Ser. No. 579,938
Claims priority, application France, Feb. 18, 1983, 83 02645
Int. Cl.³ F16J *15/18*
U.S. Cl. 277—212 FB **8 Claims**

1. Sealing device for an hydraulic energy dissipator of the telescopic type, comprising

(a) a working cylinder filled with liquid and divided into two

chambers by an axially moving piston provided with calibrated valves determining the hydraulic resistance, a piston rod of said piston being guided through a first end of said cylinder;

(b) an annular compensating chamber surrounding said working cylinder and communicating through a valve and a calibrated valve with said working chamber adjacent the end of said cylinder remote from said piston rod;



(c) a fluid-tight seal for the exit of said piston arranged in a housing extending said working cylinder on the rod side, said fluid-tight seal being formed from a cylindrical ring which grips said piston rod and which is extended by a fluid-tight bellows, coaxial with said rod, enabling axial movement of said seal in said housing.

4,535,999

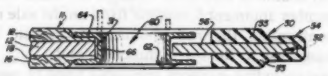
GASKET ASSEMBLY HAVING A SEALING MEMBER SUSPENDED IN A CLEAR-THROUGH OPENING AND METHOD OF MAKING SAME

Robert F. Locacius, Lake Zurich, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Jul. 23, 1984, Ser. No. 633,449

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—235 B **18 Claims**



1. A gasket assembly adapted to be positioned between a pair of surfaces to be sealed and to be compressed therebetween, said gasket assembly comprising:

a main gasket body comprising an expansive, flat central core, said main gasket body defining a plurality of openings, including a plurality of bolt openings in said main gasket body,

a compressible sealing member positioned in at least one opening to be sealed, said sealing member comprising an insert having upper and lower surfaces and compressible material on each of said upper and lower surfaces of said and at least two suspending members secured to said main gasket body and each member having portions spaced overlying and underlying peripheral portions of said sealing member, said suspending members each having second portions overlying and underlying said main body portion adjacent said opening to be sealed, thereby to suspend said sealing member in said opening to be sealed.

4,536,000

JAW POSITION AND/OR FORCE DETECTOR FOR POWER CHUCK

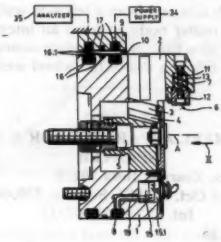
Günter H. Röhm, Heinrich-Röhm-Strasse 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,698

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1982, 3241556

Int. Cl.³ B23B *31/28*

U.S. Cl. 279—1 R **20 Claims**



1. In a chuck having a chuck body rotatable about an axis, a plurality of jaws radially displaceable on the body and each having a radially inwardly directed workpiece-engaging face, and an axially displaceable operator linked to the jaws to radially displace same relative to the chuck body, the improvement comprising:

respective means on the chuck body including transducers connected to the jaws for generating a signal proportional to a parameter of the respective jaw;

signal-transmitting means on the chuck for transmitting the signals from the chuck body;

stationary signal-receiving means adjacent the chuck body for receiving the transmitted signals wholly without physical contact with the signal-transmitting means;

stationary energy-transmitting means adjacent the chuck body for transmitting energy; and

respective energy-receiving means on the chuck body for receiving the transmitted energy wholly without physical contact with the energy-transmitting means and for powering the signal-transmitting means therewith, said transducer being a force transducer and is braced between the respective jaw and the operator, each jaw having a radially inner part forming the respective workpiece-engaging face and a radially outer part coupled to the operator and limitedly radially displaceable relative to the respective inner part, the transducers being engaged generally between the parts.

4,536,001

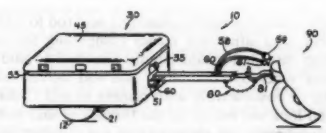
MOTORCYCLE CARGO TRAILER

Robert E. Wagner, Rte. 1, Box 34, Farmington, Wash. 99128

Filed Jan. 24, 1983, Ser. No. 460,166

Int. Cl.³ B60P *3/24*; B62K *27/00*

U.S. Cl. 280—5 C **4 Claims**



1. A motorcycle cargo trailer for use behind a motorcycle or other tandem two-wheeled vehicle comprising:

a trailer body;

left and right suspension swing arm assemblies having first

and second ends; the first end of the swing arm assemblies being pivotally mounted to the trailer;

left and right wheels rotatably mounted to the second ends of the left and right swing arm assemblies; the left and right wheels being enclosed within wheel wells which are within the trailer body;

biasing and shock absorbing means pivotally connected at one end to the left and right swing arm assemblies and at the other end pivotally connected to the trailer body; and

a fuel reservoir at the front of the trailer body; said fuel reservoir having a top plate which connects with and extends from a front wall of the trailer body to the wheel wells at each side and from a left side wall to a right side wall of the trailer body to form an integral part of the trailer body structure; said top plate connecting with the wheel wells below a top of the wheel well.

4,536,002

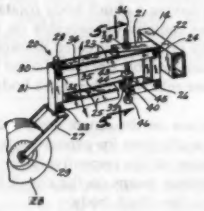
GAUGE WHEEL APPARATUS FOR A BANDING SPRAYER

Harley G. Osborn, Zearing, Iowa 50278

Filed Oct. 6, 1983, Ser. No. 539,490

Int. Cl.³ B62D *61/12*

U.S. Cl. 280—43.18 **1 Claim**



1. A shock absorbing gauge wheel apparatus for attachment to a tool bar having spraying equipment attached thereto, said apparatus comprising:

an L-shaped member rigidly attached to said tool bar;

a yoke;

a gauge wheel;

a yoke means for rotatably mounting said gauge wheel along a horizontal axis to said yoke;

journal means for pivotally mounting said yoke along a vertical axis;

an upper link member;

means for pivotally connecting said upper link member at one end thereof, along a horizontal axis, to said L-shaped member;

means for pivotally connecting the other end of said upper link member, along a horizontal axis, to said journal means;

a lower link member;

means for pivotally connecting said lower link member at one end thereof, along a horizontal axis, to said L-shaped member;

means for pivotally connecting said lower link member at the other end theroef, along a horizontal axis, to said journal means;

a rod;

adjustable means for rigidly attaching said rod to said L-shaped member, said adjustable means comprising threads on said rod and threaded means rigidly attached to said L-shaped member whereby rotation of said rod moves said rod upwardly or downwardly with respect to said L-shaped member and lock nut means on the threads of said rod for selectively preventing or allowing said rod to rotate with respect to said L-shaped member;

pivot means for pivotally attaching said rod to the lower link member; and

shock absorbing biasing means attached to said rod for biasing said link means downwardly and absorbing shock when said wheel hits a bump, said biasing means being a compression spring in abutment on one end thereof with said pivot means, said compression spring being in operative abutment on the other end thereof to a pin extending through said rod.

4,536,003

PIVOT LIMITER FOR STEERED WHEELS

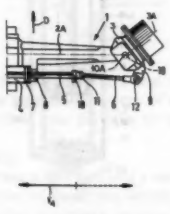
Dieter Maurer; Jürgen Rauter, both of Friedrichshafen, and Peter Dziuba, Überlingen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,251

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205979

Int. Cl.³ B62D *5/06, 7/06, 7/20*

U.S. Cl. 280—95 R **14 Claims**



1. A steered axle assembly comprising:

a relatively fixed axle member;

a pair of wheel supports pivotal on the axle member about respective upright wheel pivot axes spaced horizontally apart on the member transverse to a predetermined horizontal travel direction;

an at least limitedly articulated track rod extending horizontally transverse to the travel direction between the wheel supports and having outer ends pivoted on the respective wheel supports about respective upright track axes spaced in the travel direction from the respective pivot axes;

actuator means fixed to the axle member and connected to the track rod between the track axes for relatively displacing the rod and axle member horizontally transverse to the travel direction and thereby generally identically pivoting the wheel supports on the axle member about the respective wheel pivot axes;

a rod abutment formation fixed on the track rod;

a member abutment formation fixed on the axle member and confronting the rod abutment formation horizontally transverse to the travel direction; and

means including a spacer releasably fixed to one of the formations and engageable horizontally perpendicular to the travel direction with the other formation for limiting pivoting of the wheel supports in one direction relative to the member beyond an end position with the spacer engaging the other formation.

4,536,004

MOVABLE FOOT-STEP FOR A VEHICLE

Thore Brynielsson, Borgholm; Tom Tomasson, Löttorp; Leif Ahlberg, and Magnus Johansson, both of Gothenburg, all of Sweden, assignors to Ab Thoreb, Borgholm, Sweden

Filed Jul. 19, 1982, Ser. No. 400,116

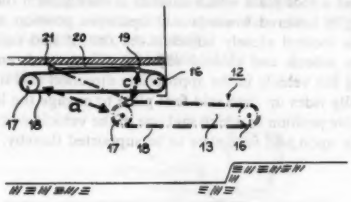
Claims priority, application Sweden, Aug. 3, 1981, 8104651

Int. Cl.³ B60R *3/02*

U.S. Cl. 280—166 **11 Claims**

1. A movable foot-step for a vehicle, operable by a mechanism including a guide device below the floor of the vehicle for extension of the step outside one side of the vehicle in an outwardly/downwardly movement, and retraction in an oppo-

site inwardly/upwardly movement, comprising: a support structure over which an endless mat is stretched with an upper part extending substantially horizontally; and means for limiting the freedom of movement of one portion of the mat to facilitate upward movement of said portion, while substantially retaining said portion against movement in one direction of movement of the foot-step.



4,536,005

FRONT LEG SHIELD FOR A MOTOR SCOOTER

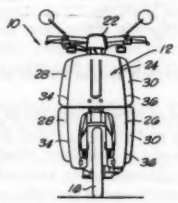
Norio Tanaka, Tokyo; Takeo Miura, Saitama, and Jiro Miyata, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 473,136

Claims priority, application Japan, Mar. 19, 1982, 57-44088

Int. Cl.³ B62J *17/06*

U.S. Cl. 280—289 S **9 Claims**



1. A front leg shield for a motor scooter, comprising

a front panel symmetrically positionable on the front of a motor scooter;

a first extension panel;

a second extension panel;

a first attachment mechanism fixed to said front panel at a first side edge thereof and to said first extension panel at an edge thereof;

a second attachment mechanism fixed to said front panel at a second side edge thereof and to a second extension panel at an edge thereof, each said attachment mechanism including a first and second hinge, each said hinge having a hinge member fixed to one of said front panel and said extension panel and a hinge pin fixed to the other of said front panel and said extension panel, said hinge pin being oblong in cross section having a major cross-sectional dimension and a minor cross-sectional dimension, said hinge member having an oblong hole for resilient receipt of said hinge pin, the long axis of said hinge pin of said first hinge being perpendicular to the major dimension of said hinge pin of said second hinge.

4,536,006

SAFETY BINDING OF A BOOT ON A SKI

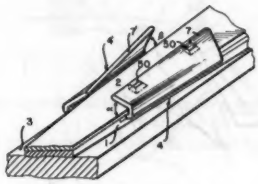
Gaston Haldemann, Fürigen, and Francois Wirz, Savièse, both of Switzerland, assignors to Haldemann A.G., Stans, Switzerland

Filed Jan. 18, 1983, Ser. No. 458,909

Claims priority, application Switzerland, Jan. 27, 1982, 495/82; Jul. 30, 1982, 4618/82

Int. Cl.³ A63C *9/085, 9/086*

U.S. Cl. 280—613 **26 Claims**



1. Safety binding for a boot on a ski comprising two lateral clamps movably mounted under the influence of a resilient member parallel to the plane of the ski between a closed position in which these clamps coact with the sole of the boot and an open position, characterized by the fact that the clamps are carried by arms pivotally mounted on the ski, said clamps having when seen from above a forwardly converging shape opening rearwardly, and by the fact that the portion of each clamp adapted to coact in closed position with the sole of the boot comprises a ramp forming with the plane of the ski an acute angle that increases from front to rear.

4,536,007

VEHICLE REAR SUSPENSION MECHANISM

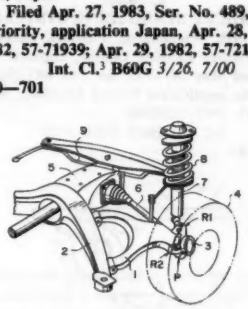
Takao Kijima; Jiro Maebayashi, and Fumitaka Ando, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 27, 1983, Ser. No. 489,132

Claims priority, application Japan, Apr. 28, 1982, 57-71938; Apr. 28, 1982, 57-71939; Apr. 29, 1982, 57-72159

Int. Cl.³ B60G *3/26, 7/00*

U.S. Cl. 280—701 **10 Claims**



1. A vehicle rear suspension mechanism comprising a suspension member connected with a vehicle body, wheel hub means supporting a rear wheel having a wheel center plane for rotation about a rotating axis, connecting means for connecting said wheel hub means with said suspension member, said connecting means including ball joint means having a pivot center located rearwardly of and below the rotating axis of the rear wheel and connecting said wheel hub to said suspension member pivotably about the pivot center, first resilient means located between said wheel hub means and said suspension member rearwardly of and above the rotating axis of the rear wheel, second resilient means located between said wheel hub means and said suspension member forwardly of and above the rotating axis of the rear wheel.

4,536,008

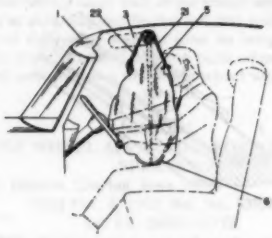
VEHICLE SAFETY RESTRAINT DEVICE

Milton F. Brown, Jr., 1105 Hartwood Ave., Virginia Beach, Va. 23454

Continuation of Ser. No. 383,001, May 28, 1982, abandoned, which is a continuation of Ser. No. 228,584, Jan. 26, 1981, abandoned, which is a continuation of Ser. No. 921,085, Jun. 30, 1978, abandoned. This application Feb. 6, 1984, Ser. No. 576,791

Int. Cl.³ B60R 21/08

U.S. Cl. 280—730 7 Claims



1. A confining means adapted in use for confining the upward and forward movements of an occupant of a vehicle, a housing means mounted to the interior overhead of a vehicle for containing said confining means, an actuating means adapted to release said confining means from said housing means, said confining means including at least one airbag and at least one torso and pelvic engaging safety restraint, said housing means including top and bottom covers which open upon application of an extending or expanding force or both, said housing being mounted on a rotatable means, said rotatable means being hollow and connected to said airbag and torso engaging restraint, said actuating means rotating the confinement means when actuating same and causes the release of same from said housing means to deploy the airbag and torso and pelvic restraint adjacent the occupant.

4,536,009

VEHICLE STABILIZING SYSTEM

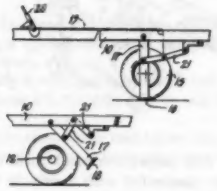
Denis H. Ashworth, Wombourne, England, assignor to Simon Engineering Dudley Limited, Dudley, England

Filed May 24, 1983, Ser. No. 497,706

Claims priority, application United Kingdom, May 28, 1982, 8215679; Oct. 29, 1982, 8230980

Int. Cl.³ B60S 9/04, 9/10

U.S. Cl. 280—755 11 Claims



1. A stabilizing system on a vehicle carrying a load-supporting platform, to prevent the platform from tilting when the load is moved relative to the vehicle, the system comprising at least one leg having one end pivotally attached to the platform at a side thereof generally above one of the vehicle wheels and the other end free to be lowered from an inoperative or travelling position in which said free end is raised above the ground, towards an operative position in which the leg depends substantially vertically between the platform and the ground outside said one of the vehicle wheels, said leg being pivotally attached to the platform on one side of the vertical plane which contains the rotational axis of said one of the vehicle wheels while the inoperative or travelling position of said leg is on the other side of said vertical plane, said leg being movable across said vertical plane containing said axis, the leg including at said free end a foot plate which extends inwardly such that when the leg is lowered towards said operative position, the foot plate is located closely adjacent the tire of said one of the vehicle wheels and closely adjacent the ground, and upon driving the vehicle in the appropriate direction said tire automatically rides up onto said foot plate to engage the leg in its operative position in which said one of the vehicle wheels rests directly upon said foot plate to be supported thereby.

4,536,010

AUTOMATIC SEATBELT SYSTEM

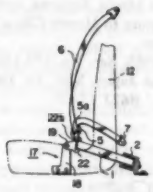
Muneharu Matsunami, Seto; Hiroshi Tsuge, Chiryu; Tatsushi Kubota, Okazaki, and Hisashi Ogawa, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, both of Tokyo, Japan

Continuation of Ser. No. 357,910, Mar. 15, 1982, abandoned. This application May 17, 1984, Ser. No. 610,939

Claims priority, application Japan, Mar. 30, 1981, 56-45045[U]

Int. Cl.³ B60R 21/10

U.S. Cl. 280—802 6 Claims



1. An automatic seatbelt system for use in a motor vehicle, comprising:

a webbing, one end of which is secured to an upper rear end of a vehicle door and the other end of which is secured to a central portion of a vehicle floor, whereby said webbing is automatically fastened over and unfastened from an occupant on a vehicle seat in accordance with closing and opening of said door, respectively;

a guide lever for guiding said webbing at the inner side of said seat, said guide lever comprising:

a main body mounted on the inner side of said seat and having a first stopper means;

a webbing guide portion with an opening thorugh which said webbing is passed, said webbing guide portion being rotatably supported on said main body through a laterally extending axis, said webbing guide portion having a second stopper means for restricting a rotational angle of said webbing guide portion within a predetermined angle in cooperation with said first stopper means;

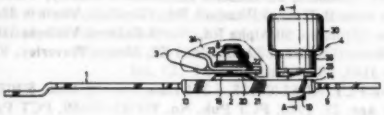
a spring having one end portion mounted on one of said main body and said webbing guide portion and an opposite end portion urged against the other of said main body portion and said webbing guide portion, said spring biasing said webbing guide portion to urge said second stopper means in a direction toward engagement with said first stopper means; and

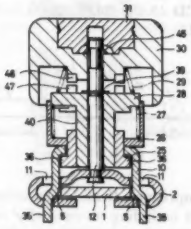
a roller rotatably mounted on said webbing guide portion, an outer periphery of said roller defining said opening through which said webbing is passed.

4,536,011
POSITION ADJUSTER FOR SEAT BELT

Katsuyasu Ono, Fujisawa, Japan, assignor to NSK-Warner K. K., Japan

Filed Feb. 6, 1984, Ser. No. 577,280
Claims priority, application Japan, Feb. 14, 1983, 58-18985[U]; Feb. 23, 1983, 58-24254[U]
Int. Cl.³ B60R 21/10
U.S. Cl. 280—808 7 Claims





1. A device for adjusting the support position of a seat belt in a seat belt system comprising:

a base;

an adjustable anchor to be guided along said base;

a belt-supporting member provided on said anchor;

a latch member mounted on said anchor for movement between an engagement position in which said latch member is engageable with said base to fix said adjustable anchor to said base and a non-engagement position in which said latch member is out of engagexent with said base so as to render said adjustable anchor movable along said base;

an operation member, said operation member bringing said latch member from said engagement position to said non-engagement position through a two-step operation in two different directions of said operation member; and

operation transmission means for transmitting to said latch member the second step motion of the two-step operation when said operation member is operated by the two-step operation so as to bring said latch member from the engagement position to the non-engagement position.

4,536,012
BOOK BINDING PROCESS

Robert M. Hume, III, Cottage Grove, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed May 15, 1984, Ser. No. 610,350
Int. Cl.³ B42D 1/00; B05D 5/10
U.S. Cl. 281—21 R 14 Claims

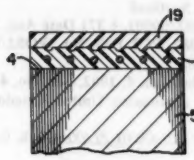
1. A continuous book binding process comprising:

forming a book block having a spine area;

coating the spine area with a primer composition comprising an adhesive latex and an amount of ungelatinized granular starch effective to complex a major portion of the latex water so that the water is evaporated in a diffuse controlled manner during the subsequent drying step;

thermally drying said coating to evaporate a substantial amount of said water and to form a flexible primer film having a uniformly irregular surface;

applying a layer of a liquid hot-melt covering adhesive to said flexible film at a temperature of about 150°-200° C., wherein the residual water released from said primer film by said applying does not disturb the integrity of said covering adhesive layer; and



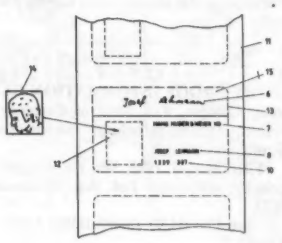
cooling said covering adhesive layer to a tacky, coherent film.

14. A book comprising a spine area coated by the binding process of claim 1.

4,536,013
MULTILAYERED INDENTIFICATION CARD

Yaya Haghiri-Therani, and Wolfgang Gauch, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 177,043, Aug. 11, 1980, abandoned.
This application Mar. 11, 1983, Ser. No. 474,418
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933436
Int. Cl.³ B42D 15/00; G09C 3/00
U.S. Cl. 283—77 3 Claims

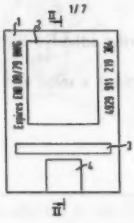


1. A multilayered identification card for use by an authorized user comprising a security paper having one or more security features incorporated therein; said security paper also having printed thereon a high quality printed security pattern, said security features and said security pattern affording protection against unauthorized reproduction of said security paper; first data relating broadly to the class of users of said identification card disposed on said identification card; second data specific to the authorized user of said identification card for assuring user identification incorporated in said identification card; at least said second data comprising an electrophotographically reproduced toner picture directly applied to a surface of said security paper so that the security pattern is located between the security paper and the toner picture in overlapping relation, and at least one transparent cover film secured to the security paper surface having said picture thereon.

4,536,014
INDENTIFICATION OF ARTICLES USING LIQUID CRYSTAL IDENTITY CARDS

Lucy A. Boutaleb; Aboubekr Boutaleb, and Tibor T. Kerekess, all of London, England, assignors to Securicard Systems Limited, Edinburgh, Scotland

PCT No. PCT/GB82/00001, § 371 Date Aug. 24, 1982, § 102(e) Date Aug. 24, 1982, PCT Pub. No. WO82/02445, PCT Pub. Date Jul. 22, 1982
PCT Filed Jan. 4, 1982, Ser. No. 414,535
Claims priority, application United Kingdom, Jan. 8, 1981, 8100492
Int. Cl.³ G02F 1/133; G03B 21/00; G06K 9/74; C09K 3/34
U.S. Cl. 283—83 6 Claims

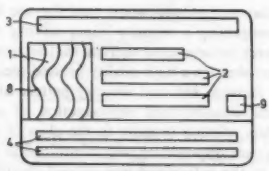


1. An identity system comprising a plurality of flat laminated identity cards and a viewer therefor, each said identity card comprising an element bearing markings and a mask permanently overlying said markings and opaque so as to block said markings from view, the mask being of a material which, upon the application of a suitable electric field, changes from the opaque state to an energized state whereby the said markings can be viewed, and said viewer comprising a spaced pair of plate electrodes, means for supporting any of said identity cards between said electrodes, and means for applying an electrical field to the electrodes to energize the mask of said card to change from its opaque to its energized state, one at least of said electrodes being in the energized state whereby the revealed markings in the identity card can be viewed through said electrode.

4,536,015
FORGERY-PROOF INFORMATION CARRIER

Fritz Kirstein, Cologne, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,882
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209277
Int. Cl.³ B42D 15/00; B05D 3/00
U.S. Cl. 283—91 6 Claims

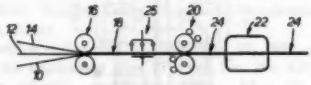


1. An information carrier comprising an information-carrying sheet-like insert
security features imprinted in ink on at least one surface of said insert, said ink having a visible spectral range and including ink which may become visible with an aid,
a pair of films each covering one of the respective plane surfaces of the insert and firmly joined thereto and at least one of said covering films having an externally applied imprint
impressed on the outer surface of the film in identical shape correspondence to security features for overlying the security feature with an imprint exactly positioned over the security feature.

4,536,016
BANKNOTES AND THE LIKE

David H. Solomon, 31 Brazilia Dr., Glen Waverley, Victoria 3150; John B. Ross, 6 Wandeen Rd., Glen Iris, Victoria 3146; Mario Girolamo, 50 Alpha Rd., North Balwyn, Victoria 3104, and Robert A. Brett, 32 McLaren St., Mount Waverley, Victoria 3149, all of Australia

PCT No. PCT/AU82/00135, § 371 Date Apr. 25, 1983, § 102(e) Date Apr. 25, 1983, PCT Pub. No. WO83/00659, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 24, 1982, Ser. No. 499,753
Claims priority, application Australia, Aug. 24, 1981, PF0383
Int. Cl.³ B42D 15/00; B42F 13/00, 5/00; B65D 19/04
U.S. Cl. 283—111 12 Claims

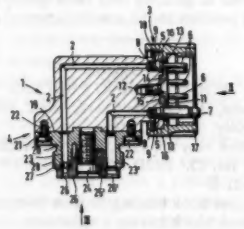


1. A token comprising a flexible film substrate bearing identifying indicia and including an optically variable security device, characterised in that the substrate comprises a transparent bi-axially-oriented polymeric film composite having a heat-activated adhesive coating and an opacifying coating on at least one side, said substrate, indicia and the security device being covered with a transparent protective layer of polymeric material intimately heat-bonded to the substrate.

4,536,017
CONNECTING DEVICES FOR USE WITH PNEUMATIC OR HYDRAULIC HOSES

Walter Weirich, Dortmund, and Bernd Peters, Dülmen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Apr. 29, 1983, Ser. No. 489,862
Claims priority, application Fed. Rep. of Germany, May 4, 1982, 3216553
Int. Cl.³ F16L 35/00
U.S. Cl. 285—26 12 Claims



1. For use in multi-line hoses employed in mineral mining installation; the combination of a connecting device and an associated fitting provided with a plate supporting plug-pins; said connecting device comprising a block with internal bores leading to outlets on outer faces of the block which extend in different directions, the outlets on each said face being disposed as a group on a common pitch circle on the face, one group of outlets forming sockets for directly receiving the

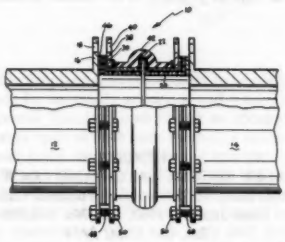
plug-pins of said associated fitting when said fitting is connected to said block, said one group of outlets having the same cross section to receive end regions of the plug-pins which all have the same cross section; wherein one of said plug-pins serves as an alignment element, is locatable in any one of said one group of outlets and is larger than the other plug-pins, other than the end region thereof.

4,536,018

RUBBER-BACKED EXPANSION JOINT

Adam J. Patarcity, Levittown, Pa., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 428,541
Int. Cl.³ F16L *27/10*
U.S. Cl. 285—229 **15 Claims**



1. An expansion joint for connecting pipe ends, comprising:
(a) a flexible tube having radially extending flanges at each end, the flanges having a front face and a rear face, each front face in use adapted to be in sealing relationship with a pipe end;
(b) a tubular stub end disposed about the tube at each end of the tube, each stub end having a radially extending flange at one end, the flange having a front face and a rear face, the front face of each stub end flange being in contact with the rear face of a tube flange; and
(c) a back-up ring disposed about the tube at each end of the tube, each back-up ring being in abutting relationship with the rear face of a stub end flange, each back-up ring having fastening means for connecting the back-up ring to a pipe end, at least one of the fastening means having a radial extent greater than the stub end flange with which the back-up ring is in contact.

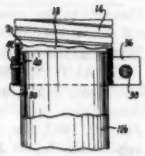
4,536,019

FLUID CONDUIT SYSTEM

Cosimo Quaranta, Turin, Italy, assignor to Tubiflex, S.p.a., Turin, Italy

Filed Jan. 12, 1983, Ser. No. 457,405
Claims priority, application Italy, Jan. 13, 1982, 52817/82[U]
Int. Cl.³ F16L *21/06*
U.S. Cl. 285—322 **9 Claims**

1. A fluid conduit system comprising:
(a) a rigid duct portion having a cylindrical outer surface;
(b) a flexible metal hose constructed from interlocking helical convolutions defining a helicoidal interior throat formed in part by a helical recess, said hose comprising:
(i) an end region telescoped over said duct portion with said interior throat confronting and contacting said duct portion surface so that said helical recess confronts said duct portion;
(ii) a plurality of generally axially extending slots formed in said hose end region and axially aligned with said duct portion;
(c) clamp means disposed about said hose end region and said duct portion, said clamp means comprising a member for urging said hose into engagement with said duct portion; and,
(d) seal means disposed in said recess, said seal means comprising a rivet extending through the hose wall and having a deformed end structure disposed in and conforming to the helical recess, said end structure urged into sealing



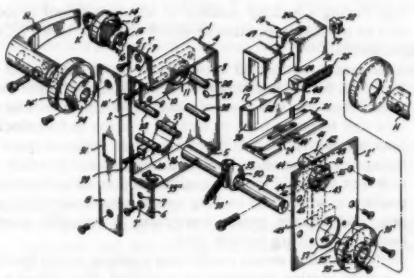
engagement with said duct portion by said clamp means for blocking passage of fluid between said hose and duct portion through said helical recess.

4,536,020

MARINE DOOR LOCKSET

Daniel C. Thomson, 5396 South Langley Rd., Langley, Wash. 98260

Filed Feb. 26, 1982, Ser. No. 352,926
Int. Cl.³ E05C *1/16*
U.S. Cl. 292—173 **13 Claims**



1. In lock mechanism for a closure member having a mortise in an edge thereof and swingably mountable in a frame member, said lock mechanism including a casing fitable in the closure member mortise, a latch bolt having a head end and a tail end and reciprocable in the casing between a latched position in which the head end portion of the bolt projects from the edge of the closure member to block opening movement of the closure member relative to the frame member and an unlatched position in which the head end of the bolt is retracted toward the edge of the closure member for enabling opening movement thereof, such latch bolt having a shoulder inside the casing and facing the tail end of such bolt, and a spindle and means operatively connecting the spindle and the latch bolt for effecting reciprocation of the latch bolt by turning of the spindle, the improvement comprising the combination of lock means movable, when the latch bolt is in its latched position, between a locking position in which a portion of said lock

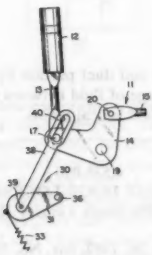
means is disposed closely behind the bolt shoulder for blocking retraction of the bolt and an unlocked position in which said lock means portion is offset from the path of movement of said bolt shoulder for enabling retraction of the bolt, and means for mounting said lock means inside the casing for movement generally linearly, transversely of the path of reciprocation of the latch bolt shoulder, between said locking and unlocked positions of said lock means, the spindle having means engageable with a portion of the lock means, when a portion of the lock means is disposed closely behind the bolt shoulder, for limiting turning of the spindle.

4,536,021

EMERGENCY UNLOCKING MECHANISM FOR DOOR OF AUTOMOBILE

Haruo Mochida, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 29, 1982, Ser. No. 393,327
Claims priority, application Japan, Jul. 8, 1981, 56-107434
Int. Cl.³ E05C 3/26
U.S. Cl. 292—201 **5 Claims**



1. A locking system for an automobile door comprising:

a locking unit for locking and unlocking the door, said lock unit having a locking position in which the door is locked and an unlocking position in which the door is not locked,

input means,

linkage means, connected between said input means and said lock unit, for transmitting movement from said input means to said lock unit and thereby making it possible to cause said lock unit to move from its locking position to its unlocking position or vice versa by moving said input means, said linkage means having a lock directing position in which said lock unit is in said locking position and an unlock directing position in which said locking unit is in said unlocking position, said linkage means comprising a movable member having a receiving portion, and

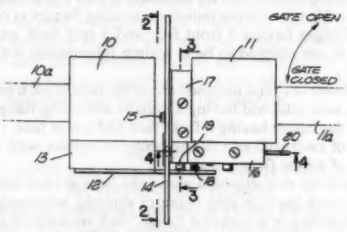
inertia actuating means comprising pushing means having a weight portion swingable in a vertical plane about a fulcrum from a normal position into a first actuating position and an actuating portion which moves together with said weight portion, lies adjacent to said receiving portion of said linkage means when said linkage means is in said lock directing position and said weight portion is in said normal position, and pushes said receiving portion to move said lock unit from its locking position to its unlocking position by moving said linkage means from said lock directing position to said unlock directing position when said weight portion swings from said normal position to said first actuating position, said inertia actuating means further comprising holding means which comprises a spring for normally holding said weight portion in said normal position irrespective of whether said linkage means is in said lock directing position or in said unlock directing position, and allowing said weight portion to swing from said normal position to said first actuating position by reason of its inertia when vehicle deceleration at a rate higher than a predetermined level takes place, said linkage means being capable of moving between said lock and unlock directing positions without causing said inertia actuating means to move as long as said weight portion is held in said normal position, said pushing means comprising an inertia lever which has a lower end having said weight portion and an upper end having said fulcrum and is capable of swinging in said vertical plane on said fulcrum from said normal position to said first actuating position, said inertia lever being capable of swinging into a second actuating position opposite to said first actuating position by reason of its inertia when a vehicle acceleration of a rate higher than a predetermined level takes place, said inertia actuating means causing said linkage means to move from its lock directing position to its unlock directing position when said inertia lever swings from its normal position to its second actuating position.

4,536,022

PARTIALLY SECURE LATCH AND LOCK DEVICE

Joseph F. Giordano, 8028 Oleander, Fontana, Calif. 92335

Filed Jun. 27, 1983, Ser. No. 508,009
Int. Cl.³ E05C 3/14
U.S. Cl. 292—228 **4 Claims**



1. A latching device for a hinged swinging gate serving an opening between first and second substantially vertical, spaced, structural members, said gate being hinged to said first structural member, and said latching device being operative between said gate and said second structural member, comprising:

first means including a strike plate mounted on said second structural member, said strike plate having an upward edge;

second means including a latch bar associated with the structure of said gate, said latch bar being pivoted about a point of the structure of said gate and having a downward opening slot, said latch bar further including a shape causing it to rotate about said pivot point and ride upward over said strike plate and thereafter engaging said upward edge of said strike place in said slot as said gate is closed;

third means including a hole in said latch bar and a latching pin for immobilizing said latch bar when said pin projects into said hole;

and fourth means for inhibiting the projection of said pin, whereby said latch bar is free to rotate about said pivot point and to engage said strike plate as said gate is closed;

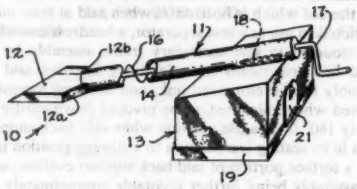
and fifth means including a spring arranged to project said pin into said hole, said fifth means including sixth means responsive to closure of said gate to release said fourth means thereby causing said spring to project said latching pin into said hole.

4,536,023

FIREPLACE SHOVEL ASSEMBLY FOR REMOVING AND TRANSPORTING ASHES

Robert E. Sutter, 1640 Edgewood Dr., Lodi, Calif. 95240

Filed Aug. 1, 1983, Ser. No. 519,126
Int. Cl.³ A47F *13/08*
U.S. Cl. 294—9 5 Claims



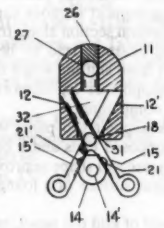
1. A portable fireplace shovel assembly to be manipulated by hand as a unit for manually scooping and transporting ashes from a residential fireplace comprising an elongate, hollow, cylindrical body open at both ends thereof, a scoop carried by one end of said body, said scoop having rearwardly converging side walls merging with said body at said one end for directing scooped material into said one end, a readily dischargeable container carried by the other end of said body to be manually transported with said body and scoop, means forming a passageway leading from said body into said container, and a screw auger conveyor disposed to rotate within said body to carry scooped material therealong from said one end to said passageway to pass into said container, and means carried at said other end of said body for rotating said auger to transport said scooped material from said one end to said container.

4,536,024

TECHNIQUES FOR SAFELY UNLOADING CARGO

Edwin Z. Gabriel, 318-B South St., Eatontown, N.J. 07724

Filed Jun. 23, 1980, Ser. No. 162,387
Int. Cl.³ B64D *1/04*
U.S. Cl. 294—82.24 16 Claims



1. A structural device for quickly releasing and unloading suspended cargo, comprising an independent upper part A, an independent lower part B and a magnetic member C, and with hoist cables attached to parts A and B:

wherein said upper part A, being a block with a frustum of a right circular cone-shaped cavity at one end and having a hole through said block at the end opposite to said cavity, said cavity having its narrow portion below its wider portion, said hole for hoist cable attachment and said cavity for part B attachment;

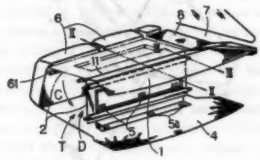
wherein said lower part B comprising a scissorlike device having a hole in each of two handles at said handle's lower ends and having a pair of dulled blades at its upper portion and pivoted with a single pivot pin at said part's midsection and criss-crossed; with said handles and said blades held apart by a properly shaped permanent magnet with rounded side edges, said member C, inserted between the interior surfaces of said handles to prevent the closing together of said blades and the consequent separation of part A from part B under suspended load conditions; said holed handles being for hoist cable attachment to said cargo, and said blades for insertion into said cavity of part A.

4,536,025

PACKAGE TRAY TRIM DEVICE FOR VEHICLES

Takesi Yamawaki, deceased, late of Okazaki, Japan (by Hiroko Yamawaki, representative); Masakazu Kusuhara, and Tatuya Saitou, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Aug. 5, 1983, Ser. No. 520,593
Claims priority, application Japan, Oct. 4, 1982, 57-151171[U]
Int. Cl.³ B60R *5/04*
U.S. Cl. 296—37.16 8 Claims



1. A package tray trim device for a vehicle for the concealment of baggage stowed in a space behind a rear seat, comprising:

a deck behind said rear seat of a vehicle;

a deck carpet covering said deck for cushioning said baggage thereon;

a package tray trim cover for concealing said baggage from outside viewing and defining a space between said rear seat and said deck, including:

a foldable first plate which is located just behind the rear seat of the vehicle,

a stationary second plate which is attached at its lateral ends to a vehicle body, and is located rearwardly behind the rear seat,

a hinge member connecting said first plate and said second plate for permitting said first plate to be downwardly folded at the hinge member,

said first plate comprising:

a main part having first fixing means secured on its back side, said back side facing said deck when said first plate is not folded; and

a return extension having second fixing means on an outward face thereof, said outward face being disposed opposite a inward face of said extension, said inward face of said extension facing said back side of said main part when said first plate is not folded,

whereby said first fixing means engages with the inward face of said extension to conceal baggage from outside viewing when said first plate is not folded, and said second fixing means engages with said deck carpet to hold said first plate in place when said first plate is folded downwardly.

4,536,026

FOLDING CHAIR

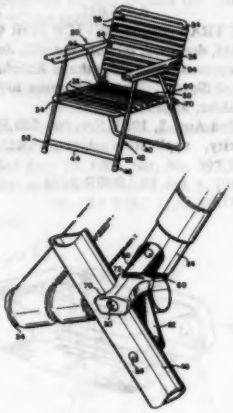
Howell N. Cornell, Miami, Fla., assignor to Keller Industries, Inc., Miami, Fla.

Filed Aug. 12, 1983, Ser. No. 522,503
Int. Cl.³ A47C *4/00*
U.S. Cl. 297—39 9 Claims

1. A foldable chair, comprising:

a back frame and a seat frame, hingeably attached to a spreader rod, the spreader rod having ends protruding past the back frame and the seat frame;

a front leg member and a rear leg member, carrying the back frame and the seat frame, the spreader rod also extending past at least one of the front leg member and the rear leg member, the spreader rod bearing transversely against said one of the front and rear leg members when the chair is unfolded; and,



a contact pad mounted on each protruding end of the spreader rod and axially-fixed to the spreader rod, the contact pad being an externally contoured bushing, axially bored to fit over the spreader rod and having an external face shaped to engage said one of the leg members, the contact pad fixing the spreader rod against axial movement thereof over said at least one of the leg members, whereby the chair is secure when unfolded and said at least one of the leg members is protected from wear due to contact with the spreader rod.

4,536,027

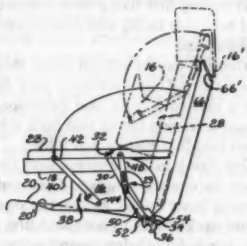
CONVERTIBLE SEATING UNIT

Edward J. Brennan, Litchfield, Conn., assignor to PTC Aerospace Inc., Bantam, Conn.

Filed Apr. 30, 1984, Ser. No. 605,453

Int. Cl.³ A47B 85/04

U.S. Cl. 297—124 **8 Claims**



1. In a multipassenger seating unit having a plurality of seating positions, at least one of which has a backrest which is pivotally mounted for reclining movement relative to the base frame of the unit and includes portions which are selectively convertible from being useable for seating to being useable as a seat separator and cocktail table to enhance the comfort of an occupant of an immediately adjacent seating position, the improvement comprising a primary back frame member pivotally mounted at its lower end for reclining movement relative to the base frame of the seat, a secondary frame assembly pivotally mounted to a multiple link support assembly which is pivoted at or near its lower end to said primary back frame member and to said base frame on the same pivot axis as said back frame primary member, said secondary frame assembly having a back support cushion located on the side thereof which faces forward when said at least one seating position is in a seating mode and a cocktail table located on the opposite side thereof which is horizontal when said at least one seating position is in use as a seat separator, a headrest assembly pivotally mounted to said secondary frame assembly by an elongated link and means for selectively latching said headrest assembly to said elongated link, said headrest assembly being adapted when unlatched, to be pivoted downwardly approximately 180° from a use position when said back support cushion is in its seating use position to a storage position in contact with a surface portion of said back support cushion, said headrest assembly being further pivotable approximately 90° with said secondary frame assembly while in said storage position to a relatively hidden position under said cocktail table when said secondary frame assembly and multiple link support assembly are moved so as to deploy said cocktail table in its use position as a seat separator.

4,536,028

FITTED SHEET FOR LOUNGE CHAIR

Mary A. Jones, P.O. Box 154, and Donna L. Tucker, Rte. 2, both of Polkton, N.C. 28135

Filed Apr. 27, 1983, Ser. No. 488,993

Int. Cl.³ A47C 27/00

U.S. Cl. 297—224 **4 Claims**

1. A fitted sheet for covering a lounge chair of the type having a substantially horizontal central section and joined back-support and leg-support sections capable of being tilted with respect to the central section along transverse hinge lines, and said sheet being characterized by being constructed for preventing the sheet from shifting when the chair is occupied or when the back-support or leg-support sections are being adjusted, said sheet comprising:

a substantially rectangular top panel whose perimeter defines a pair of opposed ends and a pair of opposed sides and which has a size and shape approximating the size and shape of the upper surface of a lounge chair of the mentioned type;

a pocket at each end of said top panel, each pocket comprising a continuous panel joined to a respective end of the top panel and to adjacent portions at least along about six inches of the sides said pockets being sufficiently deep to maintain opposite end portions of said sheet in position on opposite ends of said lounge chair;

a pair of transverse elastic straps joined to the opposed sides and located approximately ¼ the length of said sheet from each end thereof, one strap being located in the region where the sheet, in use, overlies the hinge line between the central section and back-support section, and the other being located in the region between the central section and the leg-support section, said transverse elastic straps serving to maintain the central portion of said sheet in position on said lounge chair; and

longitudinal elastic strip means secured to said opposed sides in the region where the sheet, in use, overlies the chair's

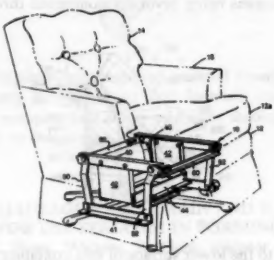
central section and maintains the central portion of said sheet in tensioned condition.

4,536,029

ROCKING CHAIR

Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.

Filed Mar. 30, 1983, Ser. No. 480,255
Int. Cl.³ A47D *13/10*
U.S. Cl. 297—281 14 Claims



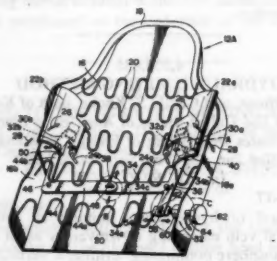
1. A rocking chair comprising a stationary base, a seat and backrest structure including a seat frame having opposite side portions and upholstery on the seat including seat springs, armrests fixed to opposite sides of the seat frame, and linkage means within the seat frame suspending the seat at said side portions from the base for rocking movement along an arc during which the seat is also displaced in a horizontal plane relative to the base, said linkage means being located below said seat springs and inwardly of said armrests and said opposite side portions of said frame, and wherein said linkage means includes two pairs of front and rear swing arms each having opposite portions pivotally mounted at pivot joints to the base and seat frame at opposite sides thereof, the distance between the pivot joints on the base being greater than the distance between the pivot joints on the seat frame, and wherein there is further included transverse anti-sway bars interconnecting the swing arms on opposite sides of the seat frame.

4,536,030

SEAT WITH ADJUSTABLE SIDE SUPPORT DEVICE

Kenichi Sakurada, Yokohama, and Takaichi Nishino, Hachioji, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Tachikawa Spring Company, Limited, Tokyo, both of, Japan

Filed Aug. 14, 1980, Ser. No. 178,057
Claims priority, application Japan, Aug. 22, 1979, 54-106115; Aug. 22, 1979, 54-106114
Int. Cl.³ A47C *3/00, 7/46*
U.S. Cl. 297—284 10 Claims



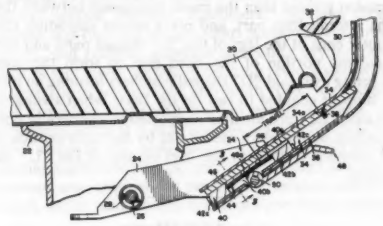
1. In combination with a vehicle seat having a backrest portion and a seating portion, a pair of movable lateral bolster sections mounted on opposite sides of at least one of said portions and projecting therefrom, and adjustment means including a pair of drive members, for selectively and simultaneously moving the bolster sections in a controlled fashion between a first lateral support position and a second lateral support position, said adjustment means being adapted to maintain the bolster sections in the first and second lateral positions wherein each of said bolster sections has inner and outer parts, said sections being connected at opposite sides of said one of said portions at their inner parts and wherein said one of said portions includes a frame assembly and wherein each of said bolster sections includes a rigid support paddle, having an outer free end portion and an inner, supported end portion, the inner end portion of said support paddle being hingedly connected to said frame assembly to permit the support paddle to rotate about a first longitudinal axis and wherein each support paddle is hingedly connected to its respective drive member to permit the support paddle to rotate with respect to the drive member about a second longitudinal axis spaced away from the first longitudinal axis to move the free end portion of the support paddle about the first longitudinal axis, coupling means pivoted to said frame assembly to rotate thereon about a pivot point, said coupling means interconnecting said drive members, operating means including a rotary drive shaft rotatably supported by said frame assembly with handle means for manually rotating said drive shaft, a coupling member threaded on said drive shaft to be movable along said shaft, said coupling member coupled to said coupling means whereby movement of said coupling member along said shaft as a result of the manual rotation of said shaft causes said coupling means to rotate about said pivot point on said frame assembly to cause said drive members to simultaneously move said support paddles.

4,536,031

BACK SUPPORT CONTROL MECHANISM FOR A CHAIR OR THE LIKE

Thomas L. Latone, Quakertown, Pa., assignor to Knoll International, Inc., New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 503,226
Int. Cl.³ A47C *7/40*
U.S. Cl. 297—353 4 Claims



1. In a back support control mechanism for a chair or the like in which said back support is mounted for movement toward and away from a seat, the improvement for providing adjustable positioning of said back support with respect to said seat in an infinite number of positions in a range of movement of said back support comprising a channel member fixed with respect to said seat, a pressure pad positioned within said channel member and fixed with respect to said back support, said channel member permitting sliding movement of said pressure pad with respect thereto resulting in movement of said back support over said range of movement, and a lever coupled to said pressure pad and movable therewith and with respect thereto and having a cam surface thereon which, in one position of said lever with respect to said pressure pad, bears against said pressure pad, causing the latter to bear against said

channel member to fix said pressure pad in position with respect to said channel member and to prevent further movement of said pressure pad, thereby fixing the position of said back support with respect to said seat, in which said back support comprises a tubing that includes a carrier therein that holds said pressure pad, said carrier includes side rails, with said pressure pad being supported between said side rails, said channel member is positioned within said tubing, and said channel member includes tracks along the sides thereof, and said side rails of said carrier ride along said tracks.

4,536,032

BODY SUPPORT

Samuel M. Highberger, 5543 Westwood La., Birmingham, Mich. 48010

Filed Sep. 1, 1983, Ser. No. 528,798
Int. Cl.³ A47C 9/12
U.S. Cl. 297—439 **6 Claims**

1. A foldable bodyrest comprising three main parts hinged together on a common connecting axis, the three parts when pivoted into a folded position lie substantially in a common plane, the first and second of the parts each having a pair of leg members connected together by a cross member to form a pair of "U" shaped members, one of the "U" shaped members forming an intermediate part having an outside dimension between its legs less than the inside dimension between the legs of the other "U" shaped member which forms an outer part and whereby the intermediate part can fit within the outer part, the third of the parts having a partial rectangular shape forming a body support and having a first narrow portion having a dimension less than the inside dimension between the legs of the intermediate part and a relatively wide portion having a dimension greater than the inside dimension between the legs of the intermediate part, and pivot means extending through the outer ends of the legs of the "U" shaped parts and through the narrow portion of the third part to form the common connecting axis, said "U" shaped members forming an inverted "V" support adapted to rest on the floor when swung on the pivot axis, said third member supported in a generally horizontal position by the pivot means and by the wide portion of the third member resting on the legs of one of the "U" shaped members.

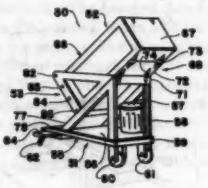
4,536,033

TRASH STORING APPARATUS

Webster F. Allen, 3005 37½ St., NW., Billings, Mont. 59102

Filed Aug. 1, 1983, Ser. No. 519,003
Int. Cl.³ B65F 1/00
U.S. Cl. 298—2 **11 Claims**

1. Trash storing apparatus including a support portion, a container portion and a container dumping portion; said support portion including a substantially horizontal frame section, an undercarriage section including a plurality of wheels extending downwardly from said horizontal frame section, an upstanding frame section extending upwardly from said horizontal frame section adjacent one end thereof, an inclined frame section extending from adjacent an opposite end of said horizontal frame section to a point adjacent the upper end of said upstanding frame section; said container portion normally resting on said inclined frame section of said support portion, said container portion extending from adjacent the lower end of said inclined frame section and upwardly therealong beyond the upper end of said upstanding frame section, said container portion including a receptacle member with an open upper end, a cover member pivotally connected adjacent an edge of said open end of said receptacle member; said container dumping portion including pivotal connecting means located between said container portion and said inclined frame section adjacent the upper end of said upstanding frame section, said pivotal connecting means including spacer means, said spacer means being pivotally connected through first hinge means adjacent the upper end of said upstanding frame section and said spacer means being pivotally connected through second



hinge means to the lower surface of said container portion at a point thereon a significant distance above said upper end of said upstanding frame section, said second hinge means being spaced from said first hinge means, handle means disposed adjacent the bottom of said receptacle member; whereby trash can be placed into said receptacle member by opening said cover member and trash can be removed from said receptacle member by grasping said handle means and raising the lower end of said receptacle member so that it pivots about both of said hinge means of said pivotal connecting means to empty said trash through said open end thereof into a receiver having a threshold above the upper end of said upstanding frame section.

4,536,034

METHOD FOR IMMOBILIZING CONTAMINANTS IN PREVIOUSLY LEACHED ORES

John B. Otto, Jr., Dallas, and James M. Paul, DeSoto, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 14, 1983, Ser. No. 484,766
Int. Cl.³ E21B 43/28
U.S. Cl. 299—5 **16 Claims**

1. A method for restoring a subterranean formation subjected to oxidative leaching, excluding a carbonate leaching process, to environmentally acceptable levels of soluble contaminants by use of an aqueous restorative fluid comprising:

(a) making said restorative fluid with sufficient phosphate ions therein and a pH value suitable for forming insoluble precipitates in said fluid with the ions of said soluble contaminants; and

(b) injecting said restorative fluid into said formation in a volume sufficient to form an insoluble precipitate within said formation.

4,536,035

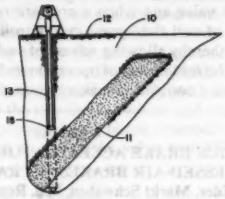
HYDRAULIC MINING METHOD

Lester H. Huffman, and Gerald S. Knoke, both of Kent, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 15, 1984, Ser. No. 621,294
Int. Cl.³ E21C 37/12
U.S. Cl. 299—17 **9 Claims**

1. A method of hydraulically mining an underground pitched mineral vein extending downwardly at an angle into the earth's lithosphere comprising: drilling a vertical borehole extending from the ground surface to a depth adjacent the footwall of said mineral vein, forming an enlarged diameter sump cavity at the lower end of said vertical borehole, drilling

a slant borehole from said ground surface and along said footwall to intersect the lower end of said vertical borehole, removing material from said mineral vein by directing a fluid jet



stream thereagainst, said removed material forming with said water a slurry flowing down said footwall into said sump cavity, and pumping said slurry upwardly through said vertical borehole to the ground surface.

4,536,036

PINLESS HAULAGE DRIVE CHAIN AND RACK-FORM LINK FOR USE SERIATIM IN FORMING SAME

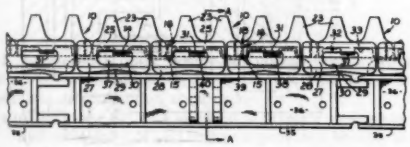
Thomas M. Hogg, Wishaw, Scotland, assignor to Anderson Strathclyde Plc, Glasgow, Scotland

Continuation of Ser. No. 437,529, Oct. 29, 1982, abandoned. This application Oct. 24, 1984, Ser. No. 664,744

Claims priority, application United Kingdom, Oct. 31, 1981, 8132885

Int. Cl.³ E21C *35/20*

U.S. Cl. 299—43 **7 Claims**



1. A rack form link component adapted for loose interfitment with like rack form link components to form a chain free of hinge pins and co-operable with a drive roller means, said link component having opposite ends of mutually complementary shape one said end forming a projection of T-shape in plan view and the other said end forming a recess of T-shape in plan view to receive as a clearance fit the projection of an adjoining link component, a central upstanding spine of rack formation and integral therewith on either side of the spine two walls of the same length but one vertically deeper than the other thus forming a saddle, the shallower wall being used as trapping means for a mineral mining machine on its traverse along a conveyor, the deeper wall to be encompassed by trapping means for the link itself via a shoulder extending from this wall, and locating means situated within the saddle and in the form of a block positioned on the underside of the rack formation spine.

4,536,037

CUTTING TOOTH FOR STRIP MINING APPARATUS

Richard H. Rink, Huron, S. Dak., assignor to Huron Manufacturing Corporation, Huron, S. Dak.

Filed Jul. 18, 1983, Ser. No. 514,957

Int. Cl.³ E21B *10/62*

U.S. Cl. 299—92 **8 Claims**

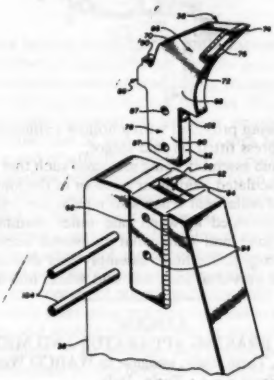
1. A replaceable cutting tooth for the cutting head of a mining machine or the like, said cutting head including a cutting arm for shifting said tooth through a cutting path of travel and said cutting arm having a plurality of inwardly facing side walls defining a tooth receiving receptacle therein and structure defining a first cutting arm retaining pin receiving channel, comprising:

a base portion having opposed, generally parallel first and second side walls and generally arcuate top and bottom walls interconnecting said side walls, said top and bottom walls intersecting with each other to define a forwardmost cutting edge;

an insert portion operably connected to and extending rearwardly from said base portion, including—

a pair of opposed insert portion sidewalls depending from said base portion sidewalls to coextensively define cutting tooth sidewalls;

structure defining a first cutting tooth retaining pin receiving channel extending between said insert portion sidewalls, and oriented generally perpendicular to said path of travel;



opposed insert portion top and bottom walls interconnecting said insert portion sidewalls, and oriented generally perpendicular to said path of travel;

structure defining a first insert portion cavity opening to said insert portion top wall, and a second insert portion cavity opening to said insert portion bottom wall;

first and second resilient, elastomeric members received within said first and second insert portion cavities respectively, said resilient members projecting beyond the surface of said insert portion in abutting relationship with the sideweallls of said cutting arm tooth receiving receptacle for providing said insert portion with a resilient, shock absorbing force fit within said cutting arm receptacle; and

a first retaining pin removably received within said first cutting tooth retaining pin receiving channel and said first cutting arm channel for removably locking said cutting tooth within said cutting arm tooth receiving receptacle.

4,536,038

WHEEL HUB ASSEMBLY FOR A MOTOR VEHICLE

Werner Krude, Siegburg-Kaldauen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,445

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319472

Int. Cl.³ F16C *11/06*

U.S. Cl. 301—124 R **2 Claims**

2. A wheel hub assembly including a wheel carrier comprising:

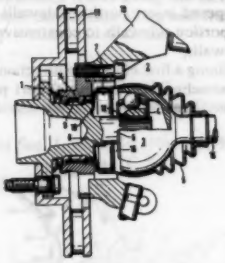
a hub member having a spigot axially extending from one end of said hub member;

bearing means including an inner race formed on said hub member and an outer race bolted to said wheel carrier;

a constant velocity ratio universal joint having an inner member received on said spigot and an outer member;

a retaining ring located on said inner member at an end thereof closest to said hub member holding said inner member on said spigot;

a collar on said hub member having an open end facing said universal joint and adapted to have mounted thereon a sealing sleeve extending over said universal joint;



said collar being provided with a hollow cylindrical portion which is press fitted on said spigot;

said wheel hub assembly being arranged such that when said joint is articulated, said outer member of the joint partially enters said collar and when said joint is not articulated, a space is provided between said outer member of said universal joint and said collar to permit access to said retaining ring to facilitate assembly and disassembly between said universal joint and said wheel hub assembly.

4,536,039

VEHICLE BRAKING APPARATUS AND METHOD

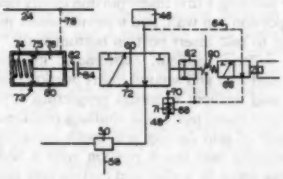
Dario Barberis, Turin, Italy, assignor to WABCO Westinghouse Compagnia Freni S.p.A., Turin, Italy

Filed Dec. 23, 1983, Ser. No. 564,665

Claims priority, application Italy, Jan. 7, 1983, 67013 A/83

Int. Cl.³ B60T *15/18*

U.S. Cl. 303—16 **16 Claims**



1. An improved vehicle braking apparatus that allows the vehicle brakes to resume operation when the magnitude of an electrical signal to an electro-fluidic portion of said braking apparatus is less than a predetermined minimum value, said braking apparatus comprising:

(a) a fluid pressure controlled braking means for supplying a first pressurized fluid in response to a pressure differential between a brake pipe and said fluid pressure controlled braking means;

(b) an automatic selector valve means for supplying pressurized fluid to said brakes of said vehicle, said automatic selector valve means having at least one fluid entry port connected to said fluid pressure controlled braking means to selectively receive said first pressurized fluid;

(c) an electro-fluidic braking means for supplying a second pressurized fluid in response to an electrical signal;

(d) a release means having at least one fluid entry port connected to said electro-fluidic braking means to receive said second pressurized fluid, said release means communicating said second pressurized fluid to said automatic selector valve means, said release means for isolating said electro-fluidic braking means from said automatic selector valve means and venting at least a portion of said second pressurized fluid when said electrical signal to said electro-fluidic braking means is less than said predetermined minimum value and when a pressure reduction in said brake pipe of said fluid pressure controlled braking means occurs thereby allowing release of said brakes of said vehicle and the resumption of operation under control of said fluid pressure controlled braking means.

4,536,040

SERVICE BRAKE ACCELERATOR FOR INDIRECT COMPRESSED-AIR BRAKES ON RAILWAY VEHICLES

Herbert Eder, Markt Schwaben, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

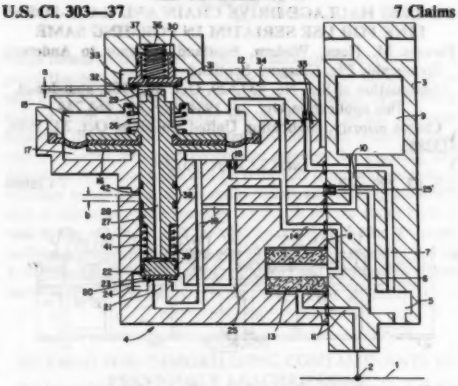
PCT No. PCT/DE80/00170 § 371 Date Jul. 8, 1981, § 102(e) Date Jul. 8, 1981, PCT Pub. No. WO81/01393, PCT Pub. Date May 28, 1981

PCT Filed Nov. 12, 1980, Ser. No. 285,076

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1979, 2946657

Int. Cl.³ B60T *15/42*

U.S. Cl. 303—37 **7 Claims**



1. A service brake accelerator for indirect brakes on railway vehicles, having

a reference pressure chamber connected via a nozzle to the main airpipe;

a control piston loaded by the pressure in the main airpipe against the pressure in the reference pressure chamber;

a shutoff valve which can be closed by the control piston in the case of predominant action by the pressure in the reference pressure chamber, and which is in a connection from the main airpipe to a piston chamber acted upon by an auxiliary pressure;

an outlet valve system which can be opened by the control piston in the case of predominant action by the pressure in the reference pressure chamber, and is in throttled connections from the main airpipe and from the piston chamber to atmosphere; and

an air vent valve controlled by a valve piston and in a connection throttled via a further nozzle, from the reference pressure chamber to the atmosphere, where:

the valve piston in the closing direction of the air vent valve is loaded by the force of a spring and the pressure in the piston chamber against the pressure in the reference pressure chamber, which with the air vent valve closed acts only upon a partial area; and where:

the control piston, the shutoff valve and the outlet valve system are arranged coaxially and the shutoff valve and the outlet valve system can be actuated by means of a valve stem connected to the control piston, characterized in that:

the outlet valve system comprises a first outlet valve (31, 32) between the main airpipe (1) and the atmosphere, and

a spatially separate second outlet valve (38, 42) between the piston chamber (40) and the atmosphere; that

the shutoff valve (29,31) having a closing stroke (a) which is at most equal to an opening stroke of the first outlet valve (31, 32) beginning from a rest position and with reference to the control piston (16), the second outlet valve (38,42) having an opening stroke (b) which is greater than the opening stroke of the first outlet valve (31,32);

the valve piston (22) is disposed coaxially with the control piston (16) and at the side thereof where said valve piston is acted upon by pressure in the piston chamber (40) and is engageable against an end of the valve stem (27).

4,536,041

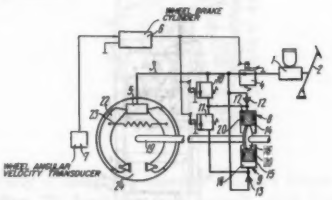
ANTI-LOCK BRAKE SYSTEM OF A MOTOR VEHICLE

Gennady M. Kosolapov; Alexandr A. Revin; Jury Y. Komarov, all of Volgograd; Vladimir A. Umnyashkin, Izhevsk; Alexandr S. Kondrashkin, Izhevsk, and Jury A. Sobolev, Izhevsk, all of U.S.S.R., assignors to Znameni Politekhnichesky Institut, Volgograd, U.S.S.R.

Filed May 2, 1983, Ser. No. 490,962

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—119 **12 Claims**



1. An anti-lock brake system of a motor vehicle provided with a power drive line, hydraulically operated brakes and a hydraulic drive therefor, comprising:

a master brake cylinder intended to produce pressure in said hydraulic drive of said brakes to provide a braking action in the motor vehicle;

a wheel brake cylinder intended to convert the pressure produced in said hydraulic drive of said brakes into a mechanical braking force;

a hydraulic pressure line connecting said wheel brake cylinder with said master brake cylinder;

a wheel angular velocity transducer to generate a signal corresponding to the actual angular velocity of the wheel;

a control unit wired to said wheel angular velocity transducer and intended to generate a control signal on the point of wheel locking;

a wheel brake release means connected to said control unit and intended to modulate pressure in said wheel brake cylinder to prevent a wheel lock condition; said means comprising:

a first electromagnetic valve disposed in said hydraulic pressure line between said master brake cylinder and said wheel brake cylinder; said first electromagnetic valve being intended to limit pressure in said wheel brake cylinder when the wheel is on the point of locking;

a cam drive having an initial value connected to said power drive line and having a cam; and

first and second identical wheel release cylinders, each having a variable volume chamber communicating with said wheel brake cylinder, and a piston for each said wheel release cylinders adapted to cooperate therewith and with said cam of said cam drive to vary the volume of said chambers; said first and second wheel release cylinders each serving to reduce pressure in said wheel brake cylinder independently to ensure a wheel anti-locking action; pressure in said wheel brake cylinder being restored to the initial value by means of said cam drive subsequent to the wheel release action.

4,536,042

PIVOT BEARING

David G. Falconer, 4673 S. 34th St., Arlington, Va. 22206

Continuation-in-part of Ser. No. 430,704, Sep. 30, 1982, abandoned. This application May 10, 1984, Ser. No. 623,450

Int. Cl.³ F16C *32/02*

U.S. Cl. 308—2 A **6 Claims**

1. A pivot bearing for use in sensitive instruments in which a shaft structure is suspended by flexible pendulums so that sliding friction and conventional rolling friction is eliminated; said pivot bearing comprising a first set of cams arranged circumferentially mounted on an outer ring-like plate face, each individual cam of said first set of cams being positively fixed to one end of a flexible pendulum; an opposite end of said flexible pendulum being positively fixed to an individual cam of a second set of cams, said second set of cams concentrically encompassed by said first set of cams and arranged circumferentially adjacent a periphery of a utility plate face, said utility plate serving as a base and center for fastening work pieces and having a shaft bore for fitting to a longer shaft, said bore being concentric to a center of pivotal mobility, said outer ring-like plate and utility plate lying in a plane normal to the pivotal axis of said first and second sets of cams; at least one set of cams having a contour of an involute; said flexible pendulums having an intermediate section between the positively fixed ends of said flexible pendulums, each of said pendulums made taut at manufacture and remediable after manufacture by adjustment to a degree, each pendulum having the same adjustment degree as measured by an instrument for measuring tension, and each individual pendulum being contiguous to said contours of said cams, irrespective of the pivotal degree of rotation and position of said utility plate, so that concentricity of said shaft bore is maintained, and said pivotal mobility is made at manufacture.

4,536,043

OPERATING DEVICE IN A DISH-WASHING MACHINE

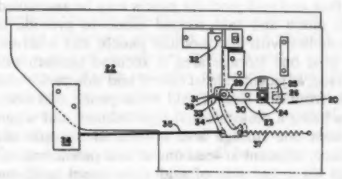
Lars G. Berglund, Alingsås; Sven-Erik B. Björklund, Älvängen, and Lars H. Linde, Alingsås, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Jul. 14, 1983, Ser. No. 513,606

Claims priority, application Sweden, Jul. 19, 1982, 8204395

Int. Cl.³ A47B *51/00*

U.S. Cl. 312—222 **4 Claims**



1. A locking device for a dish-washing machine having a vertically movable hood adapted to take an open position and a closed position, respectively, said hood being locked in its closed position during a cleaning operation, comprising: a locking means, an actuating member provided on said hood and co-acting with said locking means, and electro-magnetic

means operating to inactivate said locking means, wherein said locking means includes a curved part and a curve follower, an elastic member being provided for biasing said curved part into engagement with said curve follower, said curved part having a recess and a sloped portion, and a sharp edge interconnecting said recess and sloped portion, said actuating member during movement of the hood to its closed portion operating to bring said curve follower into said recess of the curved part, while said actuating member during movement of the hood to its open position operates to force said curve follower against the action of the said elastic means out of the recess through the sharp edge and to the sloped portion of the curved part.

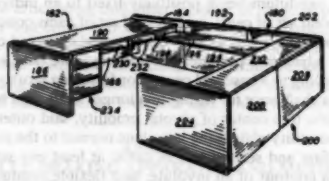
4,536,044
WORK STATIONS OF KNOCK-DOWN MODULAR COMPONENTS

Irwin I. Ziegelheim, Emerson, N.J., and Lawrence Lerner, New York, N.Y., assignors to Discovery Concepts, Inc., Carlstadt, N.J.

Continuation of Ser. No. 49,721, Jun. 18, 1979, which is a continuation of Ser. No. 885,351, Mar. 13, 1978. This application Jan. 12, 1981, Ser. No. 223,971

Int. Cl.³ A47B *43/00, 27/00*; F16B *12/00*

U.S. Cl. 312—257 R **5 Claims**



1. A working station comprising:

a. a work surface having a pair of opposed side edges and front edges;

b. a plurality of modular panels;

c. securing means for attaching said work surface and said modular panels;

wherein a first mode comprising a first pair of said modular panels are vertically disposed and attached to each of said side edges by said securing means, so as to support said work surface on the ground, and having a cross panel attached by said securing means to and vertically disposed between said first pair of modular panels,

wherein a second mode, said work surface front edge, has attached a pair of modular panels which are vertically disposed, abutting each other and standing on the ground for support of said work surface; and wherein

d. said work surface and said modular panels being fabricated for shipment in knock down condition and for on site assembly by said securing means, whereby said work surface and said modular panels may be assembled in said first mode and said second mode to provide different assemblies with said modular panels; and wherein

e. at least one storage area is secured beneath said work surface, adjacent at least one of said side panels and accessible from one side of said cross panel; said one storage area being a desk pedestal type cabinet; and wherein

f. at least one storage area is secured beneath said work surface, adjacent at least one of said panels and accessible from the other side of said cross panel; said one other storage area being a cabinet; and wherein said work station includes

g. an additional work surface;

h. a pair of additional side panels; and

i. additional securing means for attaching said additional side panels to each other and one of said side panels to form a vertical support for said additional work surface, and for attaching said additional work surface thereto so as to form a run-off said work surface; and wherein said work station includes

j. a further work surface;

k. further side panels; and

l. further securing means for attaching said further side panels to each other and to one of said additional side panels to form a vertical support for said further work surface, and for attaching said further work surface thereto so as to form a return for said additional work surface.

4,536,045
PLUG CONNECTION

Manfred Reichardt, Weinberg, and Günter Schützle, Heilbronn, both of Fed. Rep. of Germany, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 11, 1983, Ser. No. 457,315

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1982, 3201142

Int. Cl.³ H01R *4/66*

U.S. Cl. 339—14 P **10 Claims**

1. A plug connector for a flat cable including a shield, said connector comprising

a housing, said housing being formed of a metal or a metallized plastic;

an opening in said houisng;

one end of said flat cable extending through said opening for electrical connection within said housing, said flat cable comprising a cable core of a plurality of parallel wires surrounded by cable shielding; and

a shielded connecting element mounted within said housing, said element being preformed into a general S-shape cross-section and being formed of elastic sheet metal, one end of said element being in contact with an inner surface of said housing, and an opposite end of said element being inserted between said shielding and said core of said flat cable and being in electrical contact with said shielding, the width of said opposite end of said element being approximately the same as said flat cable, said element being spring loaded so as to contact said inner surface of said housing and said flat cable under spring tension, whereby said flat cable is grounded to said housing.

4,536,046
PULL OUT FUSIBLE SWITCHES

John W. Erickson, Crystal Lake, Ill., assignor to Boltswitch, Inc., Crystal Lake, Ill.

Filed Mar. 29, 1984, Ser. No. 594,905

Int. Cl.³ H01R *13/68*

U.S. Cl. 339—31 M **33 Claims**

1. An assembly system for N-pole fusible pull out switches of M different voltage/current switch ratings comprising:

a plurality of essentially identical insulator bases each including N line terminal mounts aligned one for one with N

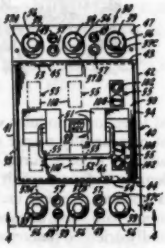
load terminal mounts, with the line terminal mounts at one end of the base and the load terminal mounts at the opposite end of the base;

a multiplicity of conductive terminals each mountable on any terminal mount in the base;

a multiplicity of conductive base contacts each mountable on a terminal in M sets of different line and load contact positions, one set for each switch rating;

a multiplicity of insulator barrier means of M types, each barrier means comprising a cover for a base, the barrier means of each type having 2N spaced connect apertures individually aligned with the line and load contact positions for one of the switch ratings and 2N similarly spaced disconnect apertures displaced from its connect apertures;

a plurality of essentially identical insulator base extensions each mountable on a base over a barrier means and defining a head receptacle;



a plurality of essentially identical insulator heads each including 2N fuseholder/stab mounts, each head being insertable into a base extension head receptacle in a connect orientation or in a disconnect orientation displaced 180° from the connect orientation;

and a multiplicity of conductive fuseholder/stab members, each fuseholder/stab member including a stab engageable with a base contact to complete a circuit connection, including fuseholder/stab members mountable on the mounts of a head in M different alignments each corresponding to the connect/disconnect aperture alignments of one type of barrier means;

each barrier means blocking insertion of any head into a head receptacle in either orientation, unless the alignment of the fuseholder/stab members in the head corresponds to the aperture alignment of that barrier means.

4,536,047

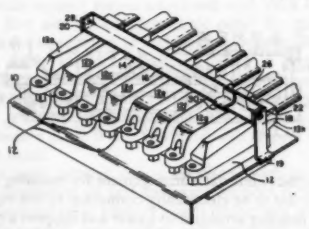
COMMUNICATIONS CONNECTOR SUPPORT BRACKET

Richard B. Varone, 81 Hilltop Dr., and Erik W. Svensson, Sr., 19 Oakside Dr., both of Smithtown, N.Y. 11787

Filed Aug. 9, 1982, Ser. No. 406,361

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—75 M **1 Claim**



1. A communications connector support bracket mounted to a terminal block for keeping male and female communications connectors from becoming loose which comprises:

(a) two vertical support posts each having a top end and a lower end, said top end having an elongated aperture, said lower end having a clip fastening means for securing each of said support posts to said terminal block, said clip fastening means comprising a C-shaped member extending from said lower end of each of said support posts;

(b) cross bar means comprising a horizontal element extending in a plane parallel to said terminal block and a vertical element extending perpendicularly from said horizontal element, said horizontal element and said vertical element forming an L-shaped member, said horizontal element having at each end thereof an extension member, each of said extension members being bent in an upward direction so as to be perpendicular to said horizontal element and said vertical element, each of said extension members being provided with a central hole;

(c) means to align said central hole of each of said extension members with said elongated aperture provided on each of said support posts and to fasten said cross bar means to said support posts to hold the male connectors in engagement with the female connectors;

(d) at least one securing spacer, said securing spacer comprising a U-shaped resilient clip member and a lateral foot member, said U-shaped clip member being resiliently secured onto said horizontal element and the lateral foot member being in abutting engagement with the vertical element of said cross bar means, and said U-shaped clip member being selectively positionable above and resiliently engagable with at least one of said male connectors whereby said cross bar means can hold a plurality of male communications connectors of different heights securely onto said terminal block.

4,536,048

ANTI-DECOUPLING MECHANISM FOR AN ELECTRICAL CONNECTOR ASSEMBLY

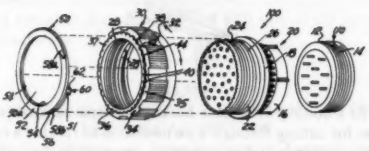
Alan L. Schildkraut, Sidney, and David W. MacAvoy, Bainbridge, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed May 11, 1983, Ser. No. 493,498

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.³ H01R *6/23*

U.S. Cl. 339—89 M **6 Claims**



1. An anti-decoupling mechanism for an electrical connector assembly, the connector assembly having a primary axis and comprising a pair of connector members and a coupling nut including a radial flange rotatably mounted to one of the connector members for coupling to the other connector member, said one connector member including an external annular groove having a transverse end wall facing forwardly and said radial flange having an outer end wall facing rearwardly, said anti-decoupling mechanism being adapted to resist both coupling and uncoupling rotation of the coupling nut and characterized by:

a cylindrical hub having an annular face extending coaxially rearward from the outer end wall of said radial flange;

a contiguous plurality of ratchet teeth disposed annularly around said annular face, one respective flank of each adjacent pair of ratchet teeth intersecting to form a detent

with the locus of intersected flanks describing a detent circle relative to the axis;

a radially expansible/contractible annular spring sufficiently interference fit within said annular groove to prevent relative rotation therebetween, the outer circumference of said spring annulus being defined by a diameter slightly less than the diameter of the detent circle; and

means extending tangentially from and radially expansible within a plane including said spring for expanding said spring and engaging said detents, application to the coupling nut of an external coupling/uncoupling torque radially expanding/contracting said spring to eliminate/increase frictional interference forces acting between the spring annulus and said annular groove, radial expansion allowing said spring to slide relative to said annular groove and radial contraction initially increasing the frictional interference forces preventing relative rotation until a sufficient external torque drives the expanding means radially outward of its detent whereby the coupling nut rotates and advances the next successive detent whereupon said spring radially contracts back into its interference fit about the annular groove.

4,536,049

CUTTING CONNECTOR

Manfred Wilmes, Detmold, Fed. Rep. of Germany, assignor to C. A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Sep. 7, 1983, Ser. No. 530,134

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233458

Int. Cl.³ H01R *13/39*

U.S. Cl. 339—97 R **7 Claims**

1. In a cutting connector having two spaced apart contact knives for cutting through wire insulation to receive a conductor therebetween and an activating member displaceable relative to the knives and with openings receptive of the insulated conductor to dispose the conductor between the knives upon displacement of the activating member, the improvement wherein: the activating member comprises a U-shaped element having opposing legs with said openings therein and means mounting the U-shaped element with one contact knife disposed between the opposing legs for pivoting movement on said one contact knife between an open position wherein said openings are outside the contact knives and a closed position wherein the openings are above and below the contact knives, and wherein the U-shaped element is configured to surround the contact knives, during the pivoting movement thereof, to a variable extent which is a function of the position of the U-shaped element and the U-shaped element includes means thereon for effecting pivotal movement thereof in response to a manually applied force.

4,536,050

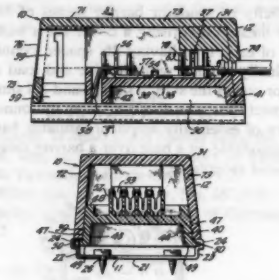
TELEPHONE MODULAR WALL JACK

Peter Hung, Huntington, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Jan. 9, 1984, Ser. No. 569,194

Int. Cl.³ H01R *13/39*

U.S. Cl. 339—99 R **1 Claim**



1. An improved telephone modular wall jack comprising: a mounting element of generally planar configuration and having a main wall adapted to be secured to a mounting surface, said mounting element defining a pair of parallel oppositely facing grooves; a housing element including a base member and a cover member, said base member having laterally extending longitudinally oriented flanges slidably engagable with said parallel grooves in said mounting element to be frictionally retained thereby; said base member defining a recess at one end thereof and a plug element disposed in said recess, said base member having elongated quick clip members arranged in mutually parallel relation on a surface thereof, said quick clip members having insulation displacement conductor engaging means on oppositely disposed ends thereof; conductor means interconnecting one end of said clip member with said plug; and said cover member selectively surrounding said base member and having means on an inner surface thereof for engaging second conductors positioned on a second end of said clip members into operative connection therewith as said cover member is pushed into engagement with said base member; whereby said mounting means may be first positioned upon a mounting surface in detached condition, and said housing element may be separately wired and subsequently engaged with said mounting element.

4,536,051

ELECTRICAL INTERFACE ARRANGEMENTS

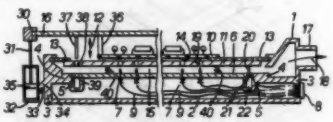
John L. Smith, and Frank H. Jenner, both of St. Albans, England, assignors to Marconi Instruments Limited, St. Albans, England

Filed Oct. 20, 1982, Ser. No. 435,361

Claims priority, application United Kingdom, Oct. 21, 1981, 8131774

Int. Cl.³ H01R *11/18*; G01R *31/02*

U.S. Cl. 339—117 P **8 Claims**



1. An electrical interface arrangement for enabling a circuit board under test to be electrically connected to test equipment including a housing arranged to locate and support a bed plate having a two dimensional array of electrical contacts projecting from one surface of it; a carriage plate mounted in align-

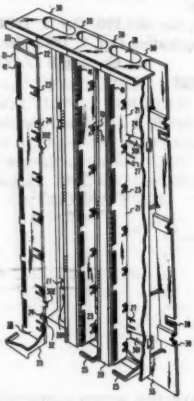
ment with the bed plate and which is movable towards and away from the bed plate and which is provided with apertures aligned with the electrical contacts so that the contacts project through the carriage plate when it is in a position closely adjacent to the bed plate; the housing being provided with a suction chamber having walls partly defined by the bed plate and the carriage plate so that when a partial vacuum is formed in the chamber the carriage plate and any circuit board carried by it can be drawn into contact with said electrical contacts; the housing also being adapted to receive and cooperate with a pressure plate assembly having a pressure plate aligned with a bed plate and which is operative to act upon the side of a circuit board remote from the carriage plate to force it into contact with said electrical contacts independently of the existence of a partial vacuum in said chamber.

4,536,052

MODULAR CROSS-CONNECT PANEL

Donn Baker, Middletown; John E. Clarke, Colts Neck, both of N.J., and Chris G. Johnson, New York, N.Y., assignors to AT&T Information Systems, Holmdel, N.J.

Filed Feb. 9, 1984, Ser. No. 578,634
Int. Cl.³ H05K *7/16*
U.S. Cl. 339—126 R **21 Claims**



1. A modular cross-connection field comprising a vertically mountable connector panel and a stationary support panel adapted to support said connector panel, said connector panel comprising,

a plurality of slots each displaced vertically from the other when said connector panel is supported in position by said support panel,

means on a first side of said connector panel for positioning and retaining with respect to each said slot a plurality of jacks, said means arranged such that jacks positioned thereby will be accessible through said associated slot from a second side of said connector panel,

first cable support means associated with each said slot on said first side of said connector panel for positioning a cable for attachment to said jacks associated with said slot said cable support means including a second flange mounted offset from and parallel to said connection panel, and wherein said stationary support panel comprises

means for supporting said connector panel such that said connector panel is free to rotate with respect to said support panel,

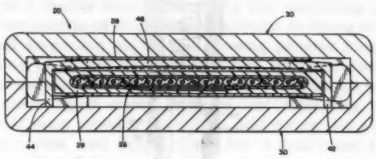
second cable support means associated with each said slot and positioned on said stationary support panel such that said second cable support means cooperates with said first cable support means when said connector panel is supported by said support panel to retain each said cable attached to each said jack associated with each said slot said second cable support means positioned with respect to said first cable support means such that when said connector panel is rotated open, said first and second cable support means are in substantially the same plane with said first cable support means displaced forward of said second cable support means and such that when said connector panel is rotated closed with respect to said stationary panel said first and second cable support means are also in substantially the same plane with said first cable support means positioned partially rearward of said second cable support means.

4,536,053

CONNECTOR ASSEMBLY HAVING GROUNDING STRAP

Ronald R. Maros, Itasca, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 23, 1983, Ser. No. 525,636
Int. Cl.³ H01R *13/648*
U.S. Cl. 339—143 R **4 Claims**



1. A connector assembly for terminating a shielded flat cable of the type comprising an array of generally parallel, regularly spaced coplanar conductors embedded in an insulative layer with a metallic shield surrounding said conductors; said connector assembly comprising:

a pair of metallic components adapted for assembly to form a housing; and

a one-piece metallic grounding strap comprising a first leg, a second leg and a spring arm extending therebetween and together with said legs defining a channel for receiving said cable, said housing defining a void for receiving said strap and said strap having a height greater than the corresponding dimension of said void whereby placing said cable in said channel and in one of the housing components, bending said shield back over said spring arm and assembling said housing results in said spring arm holding said shield in firm contact with said one of the housing components.

4,536,054

FUSE HOLDER, ESPECIALLY FUSE HOLDER FOR ELECTRICAL DEVICES

Peter Wallner, Kriens, and Peter Hollenstein, Lucerne, both of Switzerland, assignors to Schurter AG, Lucerne, Switzerland

Filed Oct. 19, 1983, Ser. No. 543,170
Claims priority, application Switzerland, Nov. 12, 1982, 6592/82
The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.
Int. Cl.³ H01R *3/00*
U.S. Cl. 339—147 R **14 Claims**

1. A fuse holder comprising:

a socket member extending along a predetermined lengthwise axis;

said socket member being formed of electrically insulating material and having an open end;

a substantially tubular-shaped head member removably inserted into said open end of said socket member along the lengthwise axis thereof;

said head member being closed at an outer end thereof and

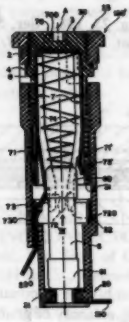
being open at an inner end thereof and being formed of electrically insulating material;

a base contact and a lateral contact containing outwardly directed connection portions secured in said socket member;

a connection conductor arranged in said head member and releasably electrically conductively connected with the lateral contact;

an axially effective compression spring;

said connection conductor and said axially effective compression spring being secured in said head member such that a fuse insert, when located in a work position thereof in the fuse holder, electrically conductively bears at one electrically conductive end thereof at the connection conductor and under the action of said compression spring



bears by means of a further electrically conductive end thereof at the base contact;

said connection conductor being formed from a spring metal and defining a substantially U-shaped bracket member having a web portion and unequal leg members;

said web portion extending transversely with respect to the lengthwise axis of the socket member and said unequal leg members protruding from said web portion;

each leg member extending at an inclination inwardly from the web portion towards an inner contact location for a related end of the fuse insert; and

one of said leg members extending outwardly from said inner contact location towards an outer contact location where it forms a frictional connection with the lateral contact at an inner side thereof.

4,536,055

STAMPED AND FORMED STACKING DEVICE FOR CIRCUIT BOARDS AND A METHOD FOR MAKING

Steven J. Kandybowski, Tower City, and Matthew M. Sucheski, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 19, 1983, Ser. No. 543,554

Int. Cl.³ H01R *11/22, 43/00*

U.S. Cl. 339—258 R **4 Claims**

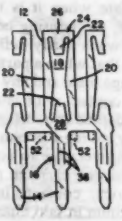
1. A method of making a device for stacking circuit boards, comprising the steps of:

a. providing an elongated strip of material and cutting out an opening adjacent a first end, defining thereby a pair of side members;

b. stamping out a leg at a second end with said leg being of less width than the width of the opening;

c. cutting a pair of longitudinal, parallel slits in the elongated strip intermediate the two ends to define three side by side parallel segments;

d. curving the first end around to near the slits so that the side members and opening define a receptacle for receiving a leg or the like therein; and



e. forming a compliant member by bending the side by side segments outwardly with alternate segments being bent in opposite directions.

3. A product as made by the method of claim 1.

4,536,056

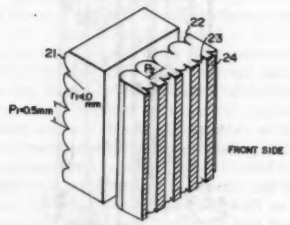
REAR PROJECTION APPARATUS

Masanori Oguino, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 308,590, Oct. 5, 1981, Pat. No. 4,432,010. This application Oct. 7, 1983, Ser. No. 539,758

Int. Cl.³ G03B *21/60*

U.S. Cl. 350—128 **18 Claims**



1. A rear projection screen comprising a Fresnel element and a lenticular sheet, said Fresnel element having a stronger prism effect at a bottom portion than at a top portion thereof and having a finite front conjugate, said lenticular sheet having horizontally-diffusing lenticular lenses on both an input surface and an output surface thereof.

4,536,057

FILTER MOUNTING MECHANISM FOR AN OPTICAL ASSEMBLY

Akiyasu Sumi, and Tohru Kawai, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 363,608, Mar. 30, 1982, abandoned. This application Mar. 20, 1984, Ser. No. 591,386

Claims priority, application Japan, Apr. 14, 1981, 56-55762; Apr. 14, 1981, 56-53357; Sep. 24, 1981, 56-151270; Jan. 27, 1982, 57-12423

Int. Cl.³ G02B *7/00, 5/20*

U.S. Cl. 350—318 **3 Claims**

1. A filter mounting mechanism for use with an optical assembly comprising:

an accessory holder having a hole formed therethrough, a holding part which carries a filter and a grip part which is arranged to enable attachment and detachment of said filter mounting mechanism to and from a filter mounting part of said optical assembly; and

filter locking means for locking said filter to said holding part,

said filter locking means having a lock member inserted into said hole formed through said accessory holder, and spring means for urging said lock member, one end of said lock member projecting to the exterior of said accessory holder,

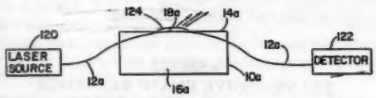
whereby said projecting portion of said lock member is pushed against the urging force of said spring means when said accessory holder is mounted on said optical assembly and said filter is held on said holding part of the accessory holder.

4,536,058

METHOD OF MANUFACTURING A FIBER OPTIC DIRECTIONAL COUPLER

Herbert J. Shaw, Stanford, and Ralph A. Bergh, Palo Alto, both of Calif., assignors to The Board of Trustees of The Leland Stanford Junior University, Stanford, Calif.

Filed Sep. 10, 1981, Ser. No. 300,955
Int. Cl.³ G01N *37/00*
U.S. Cl. 350—320 **22 Claims**



3. A method of manufacturing a fiber optic directional coupler, comprising:

removing a portion of the cladding from a clad fiber at a predetermined location intermediate the ends of said fiber;

introducing light into one end of said fiber for propagation to the other end of said fiber;

applying an index matching substance having a refractive index slightly different than the fiber core to said predetermined location;

changing the temperature of said index matching substance after it has been applied to said predetermined location to correspondingly change the refractive index thereof so that this index, at least momentarily, matches the index of the core to cause at least a portion of said light propagating through said fiber to escape from said fiber;

determining the value of the proportion of the total light introduced at said one end that propagates through said fiber to said second end when the index of said index matching substance is equal to the index of the core;

performing all of the foregoing steps until said proportion of the total light at said second end is equal to a preselected value, said preselected value corresponding to a first coupling efficiency for said coupler;

performing all of the foregoing steps for a second fiber; and

accurately positioning said fibers together, with their cores in close spaced relationship at their respective predetermined locations to form a coupler having said first coupling efficiency.

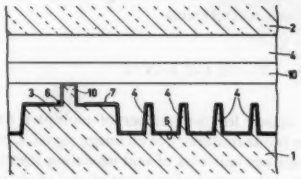
479-974 O.G.-85-8

4,536,059

LIQUID CRYSTAL DISPLAY DEVICE WITH RIDGES

Theodorus H. M. van den Berk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,423
Claims priority, application Netherlands, Jan. 11, 1982, 8200069
Int. Cl.³ G02F *1/13*
U.S. Cl. 350—333 **16 Claims**



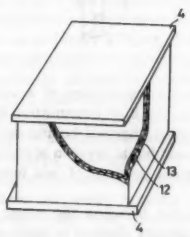
1. In a display device comprising two supporting plates; crossing patterns of strip-shaped electrodes on facing surfaces of said supporting plates, said crossing patterns forming a plurality of picture elements; orienting layers on said electrodes and exposed surfaces of said supporting plates; a layer of cholesteric liquid crystal between said supporting plates, wherein upon applying an electric field across said layer of liquid crystal, said liquid crystal has a focal-conic texture below a first field strength E_1, has a homeotropic-nematic texture above a second field strength E_2, and has one of said two textures for a field strength between E_1 and E_2; and first means for maintaining said liquid crystal in said homeotropic-nematic texture at edges of said picture elements above said field strength E_2 if said field strength between E_1 and E_2 prevails in a central part of each of said picture elements; the improvement comprising second means for dividing each picture element into a number of sub-elements, said second means further maintaining edges of each sub-element in said homeotropic-nematic texture above said field strength E_2 if said field strength between E_1 and E_2 prevails at the area of said picture element.

4,536,060

SEAL FOR DYNAMIC SCATTERING-TWISTED NEMATIC LIQUID CRYSTAL DISPLAY

Toshiaki Takamatsu, Tenri; Fumiaki Funada, Yamatokoriyama; Yutaka Ishii, and Tomio Wada, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 11, 1981, Ser. No. 233,520
Claims priority, application Japan, Feb. 29, 1980, 55-25912
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.³ G02F *1/13;* C09K *3/34*
U.S. Cl. 350—343 **13 Claims**



1. A matrix liquid crystal display device for video image

using DTN mode comprising a pair of transparent substrates defining a pair of mutually facing surfaces, a transparent electrode assembly provided on each of said mutually facing surfaces, an insulating layer with orienting property formed on said electrode assembly, a liquid crystal layer formed by depolarization in a twisted nematic layer, said liquid crystal being nematic with a negative dielectric anisotropy, said liquid crystal layer being disposed between said mutually facing insulating layers, and a polarizer provided on the opposite surface of each of said substrates from said liquid crystal layer, said liquid crystal layer satisfying the following relationship within a range of ambient temperatures:

$$16 \cdot \frac{C}{C_o} \cdot N \cdot F \gtrsim f_c \gtrsim 8 \cdot N \cdot F$$

in which N stands for the number of multiplex driving, F stands for the frame frequency of an image signal, C stands for the capacitance per unit area of said insulating layers, and C_o stands for the capacitance per unit area of said insulating layers when they have a specific dielectric constant ϵ of about 4, and a thickness of about 100 Å the fc value of the device being at least about 29 kHz, whereby the reproduction of a video image with a half-tone is achieved; said substrates being adhered to each other and sealed by two resin layers in which the outer layer is a thermoplastic polyamide layer and the inner layer is a saturated polyester layer having a higher melting point than said polyamide.

4,536,061

DISPLAY ELEMENT

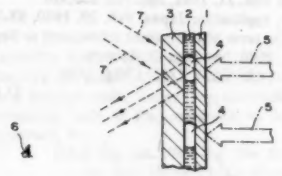
Yukuo Nishimura, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1982, Ser. No. 445,069

Claims priority, application Japan, Dec. 11, 1981, 56-200766; Dec. 11, 1981, 56-200767; Dec. 11, 1981, 56-200768; Dec. 11, 1981, 56-200769; Dec. 11, 1981, 56-200770; Dec. 11, 1981, 56-200771; Dec. 11, 1981, 56-200772; Dec. 11, 1981, 56-200773; Dec. 11, 1981, 56-200774; Dec. 11, 1981, 56-200775; Dec. 11, 1981, 56-200776; Dec. 11, 1981, 56-200777; Dec. 11, 1981, 56-200778; Dec. 11, 1981, 56-200779; Dec. 11, 1981, 56-200780; Dec. 11, 1981, 56-200781; Dec. 11, 1981, 56-200782; Dec. 11, 1981, 56-200783; Dec. 11, 1981, 56-200784

Int. Cl.³ G02F *1/01*

U.S. Cl. 350—354 **29 Claims**



1. A display element for display of a visible image, said element comprising a non-light-transmittive liquid layer and a heat generating element disposed behind said liquid layer to produce bubbles in said liquid layer in accordance with selective heating of different portions of said heat generating element;

wherein the contrast between the image and non-image sections of the display element is based on the difference between the light reflected from behind said liquid layer and the light reflected from said liquid layer.

4,536,062

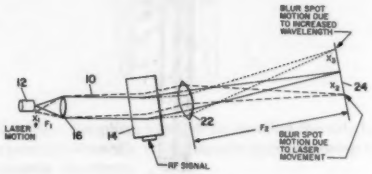
THERMAL STABILIZATION FOR AN ACOUSTO-OPTIC DEVICE

Michael G. Price, Seabrook; Otis G. Zehl, and Robert D. Boney, both of College Park, all of Md., assignors to Litton Systems, Inc., College Park, Md.

Filed Jul. 21, 1982, Ser. No. 400,466

Int. Cl.³ G02F *1/11*

U.S. Cl. 350—358 **11 Claims**



1. An acousto-optic device utilizing collimated light from a solid state laser that passes through an acousto-optic modulator, comprising:

means for mounting said solid state laser to direct said collimated light toward and through said acousto-optic modulator at an input angle thereto;

said solid state laser generating a beam of collimated light whose wavelength increases as heat within said laser increases;

said acousto-optic modulator causing the diffraction of said collimated light beam to increase as said wavelength of said beam increases for directing said beam from said modulator at an increased exit angle; and

said means for mounting said laser including heat sink means to displace said laser and thereby reduce said input angle as heat within said laser increases, wherein said laser displacement reduces said input angle to offset said increase in said exit angle of said beam.

4,536,063

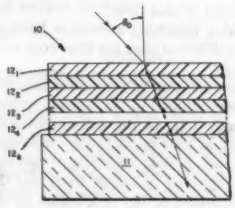
TRANSMISSIVE PHASE RETARDER

William H. Southwell, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 449,791, Dec. 14, 1982, abandoned. This application Feb. 20, 1985, Ser. No. 702,865

Int. Cl.³ G02B *5/30, 1/10*

U.S. Cl. 350—395 **5 Claims**



1. A transmissive phase retarder in which reflection of an incident beam of light is substantially reduced and in which the incident light experiences a phase retardation between the s- and p-plane polarization components of transmitted light, said transmissive phase retarder comprising:

a transmissive substrate consisting of zinc selenide;

a plurality of superimposed, thin film, transparent layers on said transmissive substrate, adjacent layers of which are made of materials of substantially different indices of

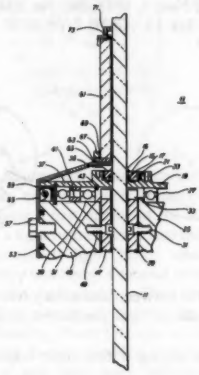
refraction, said layers being selected from the group consisting of zinc selenide and thorium fluoride, the optical thicknesses of adjacent layers being different and selected to provide a 90° phase shift between said s- and p-plane polarization components of transmitted light.

4,536,064

CLEAR VIEW SCREEN

Arnold Schindel, Fairlawn, and Edward Higgins, Jr., Madison, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Feb. 3, 1984, Ser. No. 576,843
Int. Cl.³ G02B *11/08*; E06B *7/00*
U.S. Cl. 350—583 **5 Claims**



1. In a clear viewing screen comprising: a fixed screen element; a rotatable disk-like screen element; means supporting said disk-like screen element for rotation; an electric motor for driving said disk-like screen element; and means mounting said motor to the fixed screen element, the improvement comprising:

a magnetic coupling having a first coupling half and a second coupling half, said first coupling half coupled to said motor and said second coupling half coupled to said disk-like screen element, said first and second coupling halves disposed opposite each other on opposite sides of said fixed screen element whereby said magnetic coupling will transmit torque from said motor through said fixed screen to said disk-like screen element without the need for a hole in said fixed screen, wherein said means supporting said disk-like element comprises a plurality of cam followers disposed at the periphery of said disk-like element; and

wherein said motor is supported at the periphery of said disk-like element and further including a ring gear surrounding said disk-like element; a pinion supported at the periphery of said disk-like element engaging said ring gear, said first and second coupling halves disposed respectively on said pinion and said motor.

4,536,065

FIXATION DEVICE FOR EYE TESTING

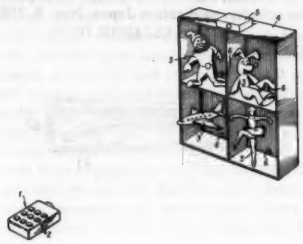
Larry A. Sheingorn, 139 Lamont La., Gaithersburg, Md. 20878

Filed Sep. 29, 1982, Ser. No. 426,886
Int. Cl.³ A61B *3/02*
U.S. Cl. 351—239 **6 Claims**

1. A fixation device for testing vision comprising:

(a) remote transmission means for transmitting any one of a plurality of characteristic signals which is selected by the examiner,

(b) receiving means having no physical connection to the transmission means for receiving and identifying said characteristic signal and for generating and directing a function command signal to the appropriate function circuitry, and



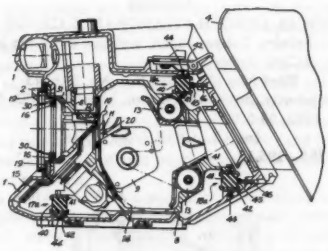
(c) function circuitry for receiving the function command signals from the receiving means and operating two or more accommodative fixation targets in response thereto, wherein said accommodative fixation targets are mechanical figures which move and emit sounds when activated.

4,536,066

ADJUSTABLE MOUNTINGS FOR A MOVIE CAMERA

Fritz Bauer, Loquaiplatz 13/26, A-1060 Vienna, Austria

Continuation-in-part of Ser. No. 61,624, Jul. 30, 1979, abandoned. This application Jul. 31, 1980, Ser. No. 174,063
Claims priority, application Austria, Jul. 30, 1979, 5242/79; Switzerland, Oct. 15, 1979, 9252/79; Austria, Jan. 2, 1980, 5/80
Int. Cl.³ G03B *31/00*
U.S. Cl. 352—35 **37 Claims**



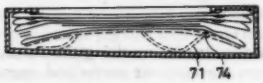
1. In a movie camera including an outer housing and an inner housing, film transport means supported on said inner housing, shutter means supported on said inner housing and film gate means supported on said inner housing, the improvement comprising at least two adjustable mounting means constructed and arranged to selectively adjustably position and secure said inner housing within said outer housing, each said adjustably mounting means being mounted to said inner housing and to said outer housing for acoustically isolating said inner housing from said outer housing, said adjustable mounting means including sound dampening means for acoustically isolating said inner housing from said outer housing, at least a first said adjustable mounting means being constructed and arranged to permit said positioning of said inner housing to be adjusted with respect to said outer housing in at least three directions, each direction being perpendicular with respect to each other.

4,536,067

FILM PACK

Yoshio Hara, and Yukihiro Sugimoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 7, 1983, Ser. No. 549,520
Claims priority, application Japan, Nov. 8, 1982, 57-196495
Int. Cl.[3] G03B *19/10*
U.S. Cl. 354—180 8 Claims



1. A film pack, comprising:

a box-shaped case body containing instant picture film units, supporting means for partially supporting said film units, said case body having an opening for exposing an image forming region of each film unit and a discharging outlet for discharging exposed film units therefrom;

first biasing means integrally formed with said supporting means, said first biasing means located in said case body urging said film units toward said opening with a first biasing force; and

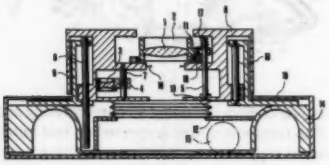
second biasing means located in said case body urging a localized portion of said image-forming region of each film unit toward said opening with a second biasing force, said second biasing force being substantially independent of said first biasing force.

4,536,068

FOCAL LENGTH CHANGEABLE CAMERA

Takanori Kodaira, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1984, Ser. No. 593,813
Claims priority, application Japan, Mar. 28, 1983, 58-52031; Mar. 28, 1983, 58-52032
Int. Cl.[3] G03B *3/00, 17/38*
U.S. Cl. 354—195.12 4 Claims



1. A focal length changeable camera comprising:

(a) a master lens system;

(b) first moving means for moving said master lens system along an optical axis of said master lens system,

said first moving means being movable between three positions, consisting of a position for moving said master lens system axially forward, another position for effecting no forward movement, and a predetermined position intervening therebetween;

(c) an auxiliary lens system;

(d) second moving means for moving said auxiliary lens system between a position where it is in the optical path of said master lens system and another position where it is retracted from said optical path,

said second moving means moving said auxiliary lens system into the optical path when said first moving means is moved axially forward from said predetermined intermediate position; and

(e) lock means for holding said first moving means stationary in said predetermined position, said lock means being actuated by setting a close-up photography mode.

4,536,069

TWO ROTARY BLADE CAMERA SHUTTER

Serge Kunica, Wellesley, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Nov. 2, 1983, Ser. No. 548,057
Int. Cl.[3] G03B *9/14, 9/22*
U.S. Cl. 354—265 6 Claims

1. An improved in between lens rotary two blade shutter for interrupting a bundle of light positioned along an optical axis comprising;

A. a first blade having a first light transmitting aperture therein;

B. a second blade having a second light transmitting aperture therein;

C. support means for rotatably supporting said first and second blades;

D. blade control means for;

D-1 initially positioning said first aperture to a first side of said optical axis to cause said first blade to intercept said light bundle;

D-2 initially positioning said second aperture of said second blade to a second opposite side of said optical axis but to the side thereof to cause said second blade to intercept said light bundle;

D-3 accelerating said first blade in a first rotary direction for causing said first aperture to move away from said optical axis and for accelerating said second blade in a second direction, opposite said first rotary direction, to cause said second aperture to move away from said optical axis so that said first and second apertures become positioned at said optical axis upon rotation of said first and second blades through an angle substantially greater than 180°;

D-4 deaccelerating said first and second blades after said first and second apertures thereof are positioned at said optical axis for producing stoppage thereof when said first aperture of said first blade is positioned at said second side to cause said first blade to intercept said light bundle, and when said second aperture of said second blade is positioned at said first side of optical axis to cause said second blade to intercept light bundle; and

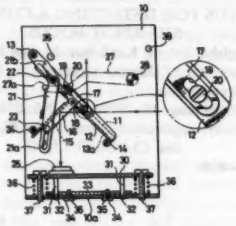
D-5 thereafter causing said first blade to become accelerated in said second rotary direction and said second blade to become accelerated in said first rotary direction, for providing rotation of said blades through an angle substantially greater than 180° before said first and second apertures again are positioned at said optical axis to effect transmission of light through said blades.

4,536,070

DEVICE FOR ADJUSTING THE FOCUSING DETECTING MECHANISM OF A SINGLE-LENS REFLEX CAMERA

Tetsuji Shono, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,457
Claims priority, application Japan, Jan. 24, 1983, 58-8053[U]
Int. Cl.³ G03B 3/00
U.S. Cl. 354—402 3 Claims



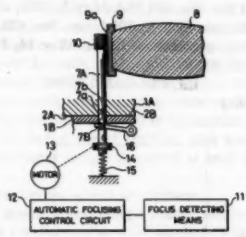
1. A device for adjusting a focusing detecting mechanism in a single-lens reflex camera which comprises: a first mirror holding frame having a first mirror of the half reflecting type adapted to divide a light beam from a lens into a reflected light beam and a transmitted light beam, and being rotatably mounted on a mirror box body; a second mirror holding frame having a second mirror adapted to reflect the transmitted light beam from said first mirror, and being rotatably mounted on said first mirror holding frame through at least one shaft; and a focusing detecting device provided at a position which is on the optical axis of said light beam reflected by said second mirror and is in conjugation with a finder focusing screen; wherein said at least one shaft for mounting said second mirror holding frame is movable in a direction which is substantially parallel with the surface of said first mirror.

4,536,071

MOUNT ARRANGEMENT AND INTERCHANGEABLE LENS UNIT FOR PHOTOGRAPHIC CAMERA

Yukio Maekawa, 5-3-1-607, Harayamadai Sakai, Osaka Prefecture; Tsuneyo Metabi, 1-29-12-306, Harumidai Sakai, Osaka Prefecture, and Masatake Niwa, 2-300-1, Higashi-uenoshiba-cho, Sakai, Osaka Prefecture, all of Japan

Filed Aug. 30, 1984, Ser. No. 645,939
Claims priority, application Japan, Sep. 2, 1983, 58-162362
Int. Cl.³ G03B 3/10
U.S. Cl. 354—400 7 Claims



1. In a lens interchangeable photographic camera capable of automatic diaphragm control and automatic focusing and including a bayonet mount device which is adapted to mount and demount an interchangeable lens unit to and from a camera body through predetermined angle clockwise rotation and counterclockwise rotation of said lens unit relative to said camera body as viewed from the front of said camera, respectively, a mount arrangement comprising:

a lens unit mount member fixedly provided on said lens unit, and having bayonet claws formed at a rearmost portion of said lens unit and an annular mount face formed forwardly of said bayonet claws;

a camera body mount member fixedly provided on said camera body, and having an annular mount face formed at a forwardmost portion of said camera body so as to be brought into contact with said mount face of said lens unit mount member with the mounting of said lens unit on said camera body completed and bayonet claws formed rearwardly of said mount face of said camera body mount member so as to be engageable with said bayonet claws of said lens unit mount member, said bayonet claws of said lens unit mount member and said bayonet claws of said camera body mount member constituting said bayonet mount device;

a positioning recess formed on said mount face of said lens unit mount member at an immediate left side portion of said lens unit mount member as viewed from the rear of said lens unit with the mounting of said lens unit on said camera body completed;

a positioning member provided on said mount face of said camera body mount member at an immediate right side portion of said camera body mount member and urged to project from said mount face of said camera body mount member for engaging said positioning recess with the mounting of said lens unit on said camera body completed;

a driven shaft for the automatic focusing, provided on said mount face of said lens unit mount member at a lower left side portion of said lens unit mount member as viewed from the rear of said lens unit with the mounting of said lens unit on said camera body completed and angularly spaced from said positioning recess by an angle which is larger than said predetermined angle for the mounting and demounting of said lens unit to and from said camera body;

a driving shaft for the automatic focusing, provided on said mount face of said camera body mount member at a lower right side portion of said camera body mount member as viewed from the front of said camera body and arranged to be engageable with said driven shaft with the mounting of said lens unit on said camera body completed for driving said driven shaft;

lens unit electrical contacts provided along the inner peripheral side of the upper portion of said lens unit mount member with the mounting of said lens unit on said camera body completed and arranged rearwardly of said mount face of said lens unit mount member and forwardly of the rear faces of said bayonet claws of said lens unit mount member;

camera body electrical contacts provided along the inner peripheral side of an upper portion of said camera body mount member and arranged rearwardly of said mount face of said camera body mount member so as to be brought into contact with said lens unit electrical contacts with the mounting of said lens unit on said camera body completed for signal transmission between said lens unit and said camera body;

a diaphragm interlocked member for the automatic diaphragm control, provided at the inner peripheral side of a left side portion of said lens unit mount member as viewed from the rear of said lens unit with the mounting of said lens unit on said camera body completed and having a rear end portion arranged rearwardly of said mount face of said lens unit mount member and forwardly of said lens unit electrical contacts so as not to interfere with said camera body electrical contacts during the start and the course of the mounting of said lens unit on said camera body; and

a diaphragm operating member for the automatic diaphragm control, provided at the inner peripheral side of a right side portion of said camera body mount member as

viewed from the front of said camera body and having a front end arranged rearwardly of said mount face of said camera body mount member and forwardly of said electrical contacts for said camera body, said rear end portion of said diaphragm interlocked member and said front end portion of said diaphragm operating member being engageable with one another with the mounting of said lens unit on said camera body completed.

4,536,072

AUTOMATIC FOCUS CONTROL SYSTEM

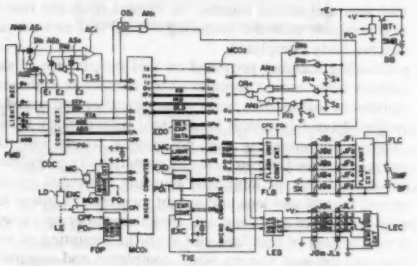
Nobuyuki Taniguchi, Tondabayashi; Norio Ishikawa, and Takeshi Egawa, both of Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

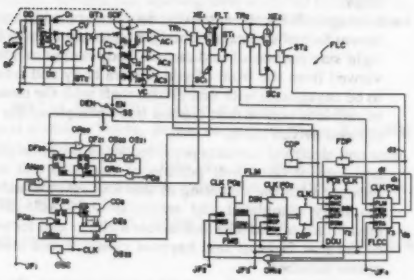
Filed Aug. 22, 1984, Ser. No. 643,669

Claims priority, application Japan, Aug. 24, 1983, 58-154378; Sep. 1, 1983, 58-161393

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—403 **36 Claims**





1. In a system for automatically controlling a focus of an objective lens operable by means of emitting a supplementary light in case the system is not satisfactorily operable under an ambient light, an improvement comprising:

means for sensing a spatial distribution of brightness of an object to provide initial data;

means for processing the initial data to provide focusing information descriptive of a focus condition of the objective lens;

means for generating a driving a power to control the focus of the objective lens in accordance with the focusing information;

means for directing the emission of the supplementary light in synchronism with the function of the sensing means;

means for examining whether or not the initial data is a reliable base of the focusing information;

means for interrupting the generating means from functioning in accordance with the focusing information obtained while the examining means fails to determine the initial data reliable;

means for detecting that the emission of the supplementary light is ready;

means for controlling the directing means to direct the emission of the supplementary light in response to a condition that the examining means fails to determine the initial data reliable and a condition that the detecting means detects the supplementary light emission ready; and

means for causing the sensing means to repeat its function.

4,536,073

APPARATUS FOR DETECTING A CONDITION OF SHARPEST FOCUS

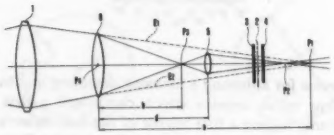
Nozomu Kitagishi, Tokyo; Kenji Suzuki, and Shinji Sakai, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1983, Ser. No. 524,300

Claims priority, application Japan, Aug. 20, 1982, 57-145294

Int. Cl.³ G03B *13/20*

U.S. Cl. 354—406 **8 Claims**



6. An in-focus detecting apparatus comprising:

(a) an objective lens for focusing an image of an object;

(b) a secondary image forming lens for refocusing the light flux from said objective lens and having an optical axis; and

(c) first and second sensors arranged on the optical axis of the secondary image forming lens, the first sensor arranged before a predetermined focal plane of said second image forming lens and the second sensor arranged after the predetermined focal plane,

said first and second sensors each comprising a plurality of photosensitive elements connected in series, and the pitch of individual elements of the first sensor being different from that of the elements of the second sensor so as to equalize the output of the first sensor to that of the second sensor.

4,536,074

EXPOSURE CONTROL MODE SELECTION DEVICE FOR CAMERA

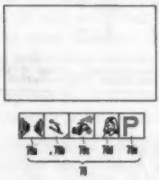
Hiromi Someya; Nobuyuki Suzuki, and Toyokazu Mizogui, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 491,052, May 3, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 679,607

Claims priority, application Japan, May 14, 1982, 57-81766; May 14, 1982, 57-81767

Int. Cl.³ G03B *7/097*

U.S. Cl. 354—442 **7 Claims**



1. An exposure control device for a camera, comprising:

exposure control means having a plurality of program lines

which have programmed combinations of aperture values and shutter times, wherein each line of said plurality of program lines of the exposure control means is different from each other;

display means having a display part to display a picture effect obtainable by said program lines with a pictograph, said means having such plurality of display parts as corresponding to a number of the program lines;

light measuring means for measuring a brightness of an object to be photographed, said light measuring means being arranged to produce an electrical signal corresponding to the brightness of said object;

selector means for selecting one program line out of said plurality of program lines and displaying a display part corresponding to the selected program line, wherein the selection operation of said selector means is guided by a pictograph which provides a concrete idea of a picture effect obtainable through said display part of said display means; and

control means for controlling a display action of each display part of said display means, said control means controlling the display of the display part corresponding to the program line selected by said selector means and receiving an output signal from said light measuring means to vary the display of the display part corresponding to the selected program line in cases where the brightness of an object does not give the picture effect expected from said program line selected by the selector means.

4,536,075

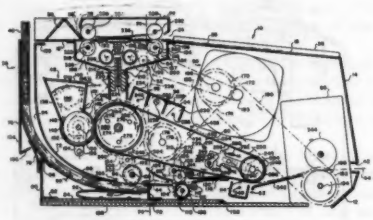
BRUSH TONING MEANS FOR ELECTROPHOTOGRAPHIC COPIER APPARATUS

Lionel B. Hoffman, Wyckoff, N.J., assignor to Tetras S.A., Paris, France

Division of Ser. No. 313,948, Oct. 22, 1981, Pat. No. 4,415,263. This application Aug. 22, 1983, Ser. No. 525,608

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 DD **7 Claims**



1. In an electrostatic copying machine which includes an imaging system having a rotary electrophotographic member, rotary means supporting the electrophotographic member to rotate in a defined endless path including an arcuate area as at least a portion of the path, means for driving the rotary means at a predetermined speed, the imaging system including means for producing a latent image on the outer surface of the electrophotographic member adapted to be carried to said portion of said path for being toned thereat, and toning means for developing the latent image disposed at said portion of said path,

the invention herein which comprises:

said toning means comprising a rotary magnetic brush journalled for rotation on an axis parallel to said arcuate area and adapted to have a toner layer applied to at least a portion of the circumference of the brush and brought into engagement with said electrophotographic member at said area, a hopper adapted to carry a quantity of toner, a cylindrical formation connected to the bottom of the hopper spaced from and encompassing all but a segment of the volume occupied by said brush, the hopper having a wall which provides a bottom edge spaced from the surface of said brush to form a metering blade adjacent said segment, the segment extending from said blade to the electrophotographic member and means provided to rotate the brush in a direction where a layer of toner will be metered onto said brush and thereafter be carried through said segment into engagement with said electrophotographic member.

4,536,076

APPARATUS FOR SUPPLYING A LIQUID TO A HEATED SURFACE

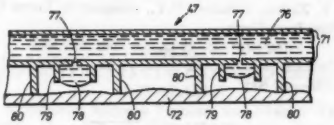
Alan E. Bickerstaff, London; Austin H. Cotton, Padbury; Michael G. Ladell, Aspley Guise, and David M. Neale, Leighton Buzzard, all of England, assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 19, 1983, Ser. No. 533,721

Claims priority, application United Kingdom, Sep. 21, 1982, 8226847

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 FU **5 Claims**



1. Apparatus for forming toner images on copy substrates including a heat and pressure fuser and a high viscosity release oil applicator therefor wherein said release oil applicator comprises:

a distribution gallery arranged to supply said release oil to a surface of said heat and pressure fuser, said gallery having a bottom wall;

a plurality of orifices in said bottom wall; and

a series of individual drop-forming chambers disposed above said surface, each of said orifices providing an oil flow path between said gallery and one of said drop-forming chambers each orifice and drop-forming chamber having dimensions which cause some oil to remain in each of said orifices as said fuser cools from its operating temperature to ambient temperature to thereby preclude air entering said gallery upon cooling of said release oil.

4,536,077

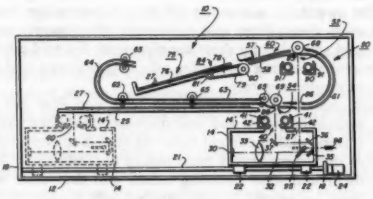
MULTI-MODE SCANNER

James C. Stoffel, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1983, Ser. No. 489,982

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—8 **9 Claims**



1. A document scanner comprising:

(a) a document supply tray;

(b) first and second scan stations;

(c) means forming a path for conveying documents removed

from said tray past said first and second scan stations in succession and back to said tray, said path including means to invert the document as the document is moving from said first scan station to said second scan station whereby one side of the document is scanned at said first scan station and the other side at said second scan station;

(d) document transport means for transporting documents from said tray along said path past said first and second scan stations and back to said tray;

(e) each of said first and second scan stations including a scanning slit through which the document moving along said path is viewed;

(f) means for illuminating said scanning slits and the document portion thereover;

(g) at least one scanning array; and

(h) optical means for selectively transmitting images of the document portion viewed through said scanning slits of said first and second scan stations to said array whereby both sides of the document are scanned.

4,536,078

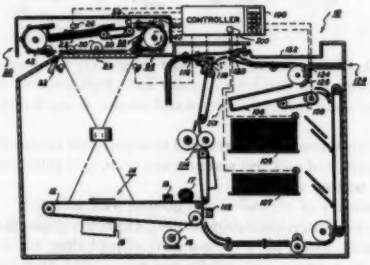
RECIRCULATIVE DOCUMENT DUPLEX COPYING

Richard T. Ziehm, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 25, 1983, Ser. No. 497,945

Int. Cl.³ B65H *5/26, 5/02, 1/06*; G03G *15/00*

U.S. Cl. 355—14 SH **7 Claims**



1. In a copier with an automatic document handling system for recirculative precollation copying, in reverse serial order, of a set of simplex document sheets to provide precollated simplex or duplex (two-sided) copies therefrom, with proper orientation of the document images on the copy sheets for copies made on preprinted, prepunched, or other special orientation restricted copy sheets, as well as for copies made on plain paper or other non-orientation sensitive copy sheets, and with counting means for counting the number of document sheets in the document set by the end of the first circulation thereof, the improvement wherein:

said copier has a special copy sheet supply means for said special orientation restricted copy sheets and a main copy sheet supply means restricted to said non-orientation sensitive copy sheets,

first switching means for selecting between the feeding of copy sheets from said main copy sheet supply means or said special copy sheet supply means for said copies,

second switching means for selecting between said simplex or duplex copying,

and control means connecting with said first and second switching means and said document handling system for causing said document handling system to circulate the set of document sheets once before copying them to count them with said counting means and determine whether there are an odd or even number only in response to both said first switching means selecting said special copy sheet supply means rather than said main copy sheet supply means and said second switching means selecting duplex copying rather than simplex copying.

5. In an automatic document handling method for recirculative precollation copying of a set of simplex document sheets on a simplex and duplex copier to provide precollated simplex or duplex (two-sided) copies therefrom, with proper orientation of the document images on the copy sheets for copies made on preprinted, prepunched, or other special orientation restricted copy sheets, as well as for copies made on plain paper or other non-orientation sensitive copy sheets, and with counting the number of document sheets in the document set by the end of the first circulation thereof, and wherein said copier has at least two separate copy sheet supplies, the improvement comprising the steps of:

loading said special orientation restricted copy sheets only into a special copy sheet supply and loading said non orientation sensitive copy sheets only into a main copy sheet supply,

selecting between the feeding of copy sheets from said main copy sheet supply or said special copy sheet supply for making copies,

selecting between said simplex or duplex copying,

and automatically circulating the set of document sheets once before copying them to count them and determine whether there are an odd or even number only in response to selecting said special copy sheet supply rather than said main copy sheet supply together with selecting duplex copying rather than simplex copying.

4,536,079

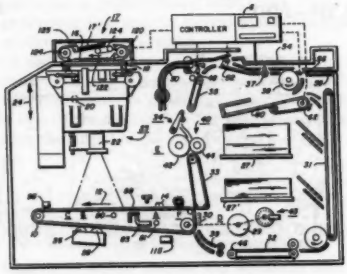
SERVICING SYSTEM FOR REPRODUCTION MACHINES

Craig S. Lippolis, and Tuan A. Nguyen, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1983, Ser. No. 526,922

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **4 Claims**



1. A method for checking and adjusting the position of a test image in the interdocument area of a recording member in a reproduction machine or printer, said machine having a plurality of discrete operating components cooperable with one another to produce copies with test image generating means adapted when actuated to produce said test image on said recording member, programming means for programming said machine for copy runs, display means for displaying the copy program, and memory means for storing the operating timing parameter of said test image generating means, comprising the steps of:

(a) using said programming means, inputting a preset service routine for accessing and displaying on said display means the current timing parameter for said test image generating means, said service routine programming said machine to produce a preset number of service copies of said test image;

(b) operating said machine;

(c) viewing the service copies produced by said machine and adjusting the timing parameter of said test image generat-

ing means to thereby change the position of said test image on said recording member; and

(d) repeating step c until the timing parameter of said test image generating means is set to place said test image in desired position on said recording member.

4,536,080

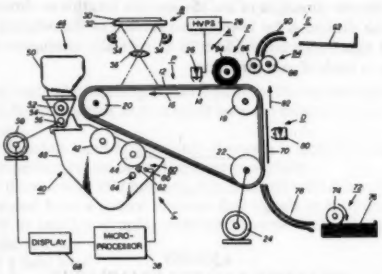
DEVELOPER MATERIAL END OF LIFE SENSING

Oscar G. Hauser, Rochester; Dusan G. Lysy, Fairport, and Richard F. Koehler, Jr., Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 19, 1983, Ser. No. 524,612

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—14 D **22 Claims**



1. An electrophotographic printing machine of the type having a developer roller transporting a developer material comprising at least carrier granules having toner particles adhering triboelectrically thereto closely adjacent to an electrostatic latent image recorded on a photoconductive surface so as to develop the latent image with toner particles, wherein the improvement includes:

a member, positioned closely adjacent to the developer roller, adapted to attract at least a portion of the toner particles to at least one surface thereof;

means for transmitting a beam of energy through said member onto the toner particles adhering to the surface thereof with the internal angle of incidence of the beam of energy being greater than the critical angle of incidence of said member;

means for detecting the intensity of the beam of energy internally reflected through said member, said detecting means generating a signal indicative of the quantity of toner particles attracted to the surface of said member; and

means for processing the signal received from said detecting means and transmitting a signal indicating the end of the useful life of the developer material.

4,536,081

DATA COPY SYSTEM

Harold A. Gell, 13720 Lockdale Rd., Silver Spring, Md. 20906

Filed Feb. 8, 1983, Ser. No. 464,853

Int. Cl.³ G03C *3/00*

U.S. Cl. 355—20 **16 Claims**

1. An apparatus for copying an image on an image display means, comprising:

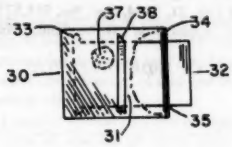
a photosensitive media;

a container for said photosensitive media adapted to hold said photosensitive media adjacent to said image display means;

an exposure opening in said container through which said photosensitive media may be exposed;

an opaque cover for said photosensitive media dimensioned to render said exposure opening light impervious;

means to permit at least partial removal of said opaque cover from said exposure opening while said photosensitive media is held adjacent to said image display means by said container, including an edge opening in said container for passing said opaque cover therethrough and between said exposure opening and said photosensitive media;



stop means on said opaque cover for preventing the complete removal of said opaque cover from said container through said edge opening; and

a developer applicator affixed to said opaque cover for applying developer to said photosensitive media.

4,536,082

TRANSFER TYPE ELECTROSTATIC REPRODUCING APPARATUS

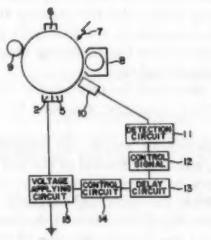
Mitsuo Motohashi; Mitsugu Nemoto, and Akihiko Tamura, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1982, Ser. No. 433,437

Claims priority, application Japan, Oct. 12, 1981, 56-161056; Oct. 12, 1981, 56-161057; Oct. 12, 1981, 56-161058

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 SH **9 Claims**



1. In electrostatic reproducing apparatus comprising a charge receptor which moves in one direction cyclically in a defined path and upon which an electrostatic latent image is formed in a first part of said path, developing means to which a developing current is supplied for developing the electrostatic image into a toner image in a second part of said path, transferring means for transferring the toner image from the charge receptor to a transfer medium in a third part of said path, and charging means for causing the transfer medium to be detached from the charge receptor in a fourth part of said path, the improvement characterized by:

A. exposure means for producing light which irradiates the charge receptor in a part of said path that is between said second and said third parts of said path, said exposure means being adjustably controllable for varying the quantity of light with which the charge receptor is irradiated;

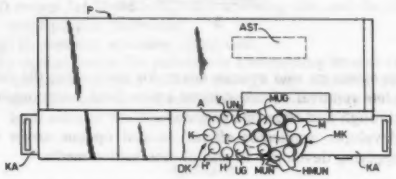
B. detection means for detecting changes in the value of said developing current; and

C. control means connected with said detection means and with said exposure means for controlling the quantity of light produced by the exposure means in accordance with the value of said developing current.

4,536,083
PROCESS AND APPARATUS FOR THE PRODUCTION OF PHOTOGRAPHIC PRINTS FROM DISK SHAPED MASTERS

René Lüscher, Regensdorf, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Feb. 21, 1984, Ser. No. 581,577
Claims priority, application Switzerland, Mar. 10, 1983, 1285/83
Int. Cl.³ G03B 27/52, 27/32
U.S. Cl. 355—40 9 Claims



1. Apparatus for the production of photographic prints from disk-shaped print masters, comprising:

a delivery magazine, a receiving magazine and at least one further magazine,

a measuring station for measuring the photographic characteristics of the individual image locations on the master disks,

a printing station for the photographic printing of the individual image locations on the master disks in accordance with the measured data determined in the measuring station, and

transportion means for transporting the master disks cyclicly from the delivery magazine into a receiving location on a transport path, guiding them over said transport path to the measuring station and the printing station and further to a transfer location on the transport path and to place them from there into the receiving magazine, said transportion means including

a magazine carrousel for rotating the delivery magazine, the receiving magazine and said further magazine in steps,

automatic switching means for rotating the magazine carrousel, after the removal of the last master disk from the delivery magazine, by one step, wherein the delivery magazine, the receiving magazine and said further magazine change positions with respect to the receiving location and the transfer location of the transport path,

follower transport means for transporting the master disks remaining on the transport path at the time of the rotation of the magazine carrousel to the receiving magazine that has moved from the transfer location to a new position by such rotation, and

stacking means for placing transported master disks into the receiving magazine.

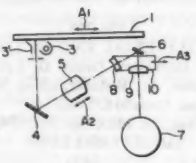
4,536,084
PROJECTION DEVICE

Mitsuhiro Tokuhara, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,692
Claims priority, application Japan, Jun. 29, 1983, 58-119179
Int. Cl.³ G03B 27/52
U.S. Cl. 355—55 10 Claims

1. A device for slit-scanning the surface of an original and projecting the image of the surface of the original onto a light-receiving medium, said device comprising:

an imaging optical system for forming the image of the surface of the original on said light-receiving medium, said imaging optical system having means which, in a first condition, has equal imaging magnifications in orthogonal directions, i.e., the widthwise direction of the slit and the lengthwise direction of the slit and is for keeping the surface of the original and said light-receiving medium in an optically conjugate relation and which, in a second condition, has different imaging magnifications in orthogonal directions, i.e., the

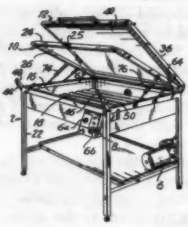


widthwise direction of the slit and the lengthwise direction of the slit and is for keeping the surface of the original and said light-receiving medium in an optically conjugate relation in both of said directions.

4,536,085
MULTIPLE VACUUM FRAME UNIT

Joseph G. Hliboki, Old Tappan, and Paul Staudenmaier, Flanders, both of N.J., assignors to Teaneck Graphics Corp., Carlstadt, N.J.

Filed Jan. 27, 1984, Ser. No. 574,489
Int. Cl.³ G03B 27/20
U.S. Cl. 355—93 14 Claims



1. A vacuum frame comprising:

a base section;

glass frame means pivotally connected with respect to said base section between a closed position and a desired opened position;

blanket frame means pivotally connected with respect to said glass frame means and said base section between a closed position and a desired opened position;

vacuum means for creating a vacuum between said blanket frame means and said glass frame means when both are in their closed positions;

control means for controlling said vacuum means to create said vacuum;

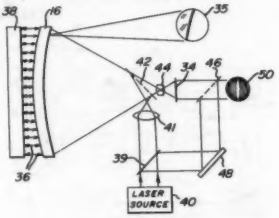
first means for maintaining said blanket frame means in a desired opened position with respect to said base section; and

second means for maintaining said glass frame means in a desired opened position with respect to said base section independent of the desired opened position of said blanket frame means.

4,536,086
HOLOGRAPHIC FIGURE SENSOR

David M. Shemwell, Dallas, Tex., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 18, 1982, Ser. No. 442,940
Int. Cl.³ G01B 9/021
U.S. Cl. 356—348 5 Claims



1. A method of making measurements of the optical figure of a thin flexible mirror from a point near the mirror focus, comprising:

(a) forming small holographic elements which when taken together, cover the entire mirrors surface;

(b) illumainting said holographic elements with a laser beam signal from a source to cause first signals to be diffracted from said holographic elements towards the focal plane of the mirror;

(c) a field lens;

(d) directing said first reflected signals through said field lens to a hologram member to record a hologram thereon representative of the optical figure of said mirror;

(e) repositioning said hologram member to permit use as a source of reference signals for subsequent measurements of said mirror;

(f) illuminating said holographic elements on said mirror with a laser signal to cause second signals to be diffracted therefrom;

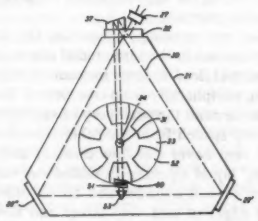
(g) directing said second diffracted signals through said hologram member to produce a corrected output signal; and

(h) directing said corrected output signal to an interferometer to indicate dimensional deviations in said optical figure of said mirror from the optical figure recorded on said hologram member.

4,536,087
DITHER COMPENSATOR FOR RING LASER GYROSCOPE

Donald Shernoff, White Plains, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Jun. 8, 1983, Ser. No. 502,370
Int. Cl.³ G01C 19/64
U.S. Cl. 356—350 3 Claims



1. In a ring laser gyroscope having an instrument casing, a gyroscope block swingably mounted to said casing, oscillating means for dithering said block with respect to said casing and about an axis of rotation, and optical sensing means attached to said casing for detecting and analyzing an interference pattern produced by a pair of laser beams traveling in opposite directions along a closed loop path lying in a first plane in said block, improved dither compensation means comprising:

(a) a passive optical element rigidly coupled at least in part to the casing and lying in a second plane parallel to the first plane;

(b) first means for directing at least one beam of the pair of laser beams to said passive optical element; and

(c) second means for directing said one beam to the optical sensing means upon passage of said one beam through said passive optical element,

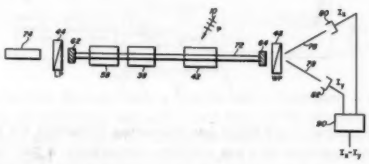
wherein said passive optical element is disposed at a distance from the axis of rotation at most equal to the smallest distance between said axis and the closed loop path, and

wherein said passive optical element comprises at least one pair of juxtaposed wedges transparent to the light of said laser beams, one of said wedges being fixed to said casing and another wedge being rigidly attached to said block.

4,536,088
POLARIMETRIC FABRY-PEROT SENSOR

Scott C. Rashleigh, 5803 Queens Gate Ct., Alexandria, Va. 22303, and Samuel J. Petuchowski, 7549 Spring Lake Dr., Bethesda, Md. 20783

Filed Sep. 17, 1982, Ser. No. 419,257
Int. Cl.³ G01B 9/02
U.S. Cl. 356—351 13 Claims



1. A fiber optic interferometer for detecting an external field, comprising:

an optical fiber waveguide capable of supporting two independent radiation modes, the two ends of the waveguide being highly reflecting, the input end of which is partially transmitting,

means for launching coherent radiation of said two modes in fixed relation to each other into said input end of the waveguide,

means for tuning said waveguide to near the resonances of said modes,

means for sensing the external field to be detected that differentially affects said two modes simultaneously so that the differential mode signal of said two modes varies with said external field signal,

and means for measuring said differential mode signal.

4,536,089
ANALYZER FOR COHERENT RADIATION

Edward T. Siebert, New Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 760,061, Jan. 17, 1977, abandoned. This application Jan. 31, 1979, Ser. No. 8,017
Int. Cl.³ G01B 9/02
U.S. Cl. 356—352 20 Claims

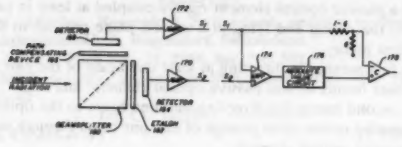
1. Apparatus for detecting the existence of a coherent source of radiation in the presence of incoherent ambient radiation comprising:

aperture means for separating incident radiation into two components to form an etalon path and a reference path;

an etalon and a first detector disposed in the etalon path;

a path compensating device and a second detector disposed

in the reference path to destroy its coherent modulation characteristics; and



means for balancing the etalon and reference paths for incoherent radiation and for producing an output indicative of the presence of a coherent source.

4,536,090

OPTICAL MULTI-BEAM GAS MEASURING APPARATUS

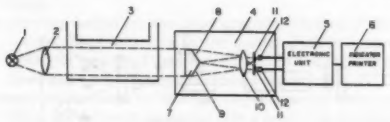
Martin Schmidt, Bad Schwartau, and Horst D. Hattendorff, Lubeck, both of Fed. Rep. of Germany, assignors to Dräger-werk Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,994

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208737

Int. Cl.³ G01N *21/61*

U.S. Cl. 356—414 **6 Claims**



1. An optical multi-beam gas measuring apparatus for measuring proportions of a gas mixture, comprising: a gas vessel through which a gas mixture to be measured is directed; means for directing a radiation through said gas vessel; a detecting device in the path of said radiation following the gas vessel, said detecting device including a one piece prism for splitting said radiation into a plurality of beam paths, said prism being symmetrical about a plane which is parallel to the path of said radiation, a collective lens for focusing radiation of said beam paths, an optical filter in each beam path and detection means associated with each of said beam paths for detecting radiation of said beam paths, said detecting device being changeable as a unit; an electronic unit connected to said detection means for generating signals; and an indicating unit connected to said electronic unit for indicating specific gases.

4,536,091

ABSORBANCE MONITOR

Robert W. Allington, Lincoln, Nebr., assignor to ISCO, Inc., Lincoln, Nebr.

Filed Jun. 1, 1979, Ser. No. 44,763

Int. Cl.³ G01N *21/01*

U.S. Cl. 356—435 **19 Claims**

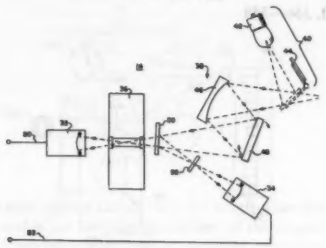
1. A method comprising the step of:

focusing light with a mirror from a small spot on the light emitting portion of a gas discharge lamp including at least a small portion of its central bright spot through an aperture in an aperture plate;

splitting the light passing through the aperture plate into two beams of light without creating a polarization difference in the two beams of light;

focusing one of said beams of light within a small aperture and using it to sense the characteristic of a sample and focusing the said other beam of light through an aperture of the same size with both apertures being of such a size as to contain within each of them the image of the aperture in the aperture plate, wherein said other beam of light serves as a reference;

converting the beams of light into electrical signals after said one beam of light has been brought into intimate contact



with the sample and comparing the signals to cancel common-mode noise; and

converting said signals to the log form of the amplitude of the signals and feeding back at least the log of one of the signals to the light source to stabilize the light source.

4,536,092

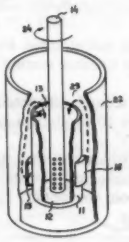
MIXING DEVICE

Abraham Kedem, 42 Weizmann St., Rehovot, Israel

Filed May 16, 1984, Ser. No. 610,835

Int. Cl.³ B01F *5/12*

U.S. Cl. 366—265 **5 Claims**



1. A mixing device to be submerged in a liquid contained in a vessel for low velocity and low shear mixing of delicate materials, such as cell suspensions, microspheres and the like, said device comprising:

a cylinder open at one end and closed at the other end;

a cylindrical drive member coaxially mounted on said cylinder for rotating the cylinder about the longitudinal axis of said tubular member;

at least two vent openings defined by the sidewall of said cylinder located in the same radial plane; and

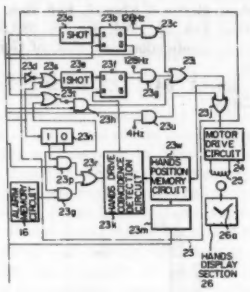
a vent cover and flow director for each of said vent openings extending peripherally from one side of the vent opening outwardly around the periphery of said cylinder terminating radially spaced from the other side of the vent opening, said vent cover and flow director defining a radially extending liquid opening bounded on one side by the periphery of said cylinder and on all other sides by the terminal edges of said vent cover and flow director for moving said liquid from the interior of the cylinder through said at least two vent openings and its vent cover and flow director, axially along the periphery of said cylinder to said open end of the cylinder by a suction created at said liquid openings when said tubular member is rotated at a speed in the range of 10 to 50 RPM.

4,536,093

ELECTRONIC TIMEPIECE WITH SYSTEM FOR SYNCHRONIZING HANDS

Masaru Yoshida, Tanashi, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,741
Claims priority, application Japan, Oct. 29, 1982, 57-190494
Int. Cl.³ G04B *17/12*
U.S. Cl. 368—187 **9 Claims**



1. An electronic timepiece, comprising:

timekeeping circuit means comprising a timebase signal source and counter circuit means for counting said timebase signal to produce a count value representing current information and a timekeeping signal comprising a pulse train;

control signal generating means comprising externally operable mode selecting switch means for producing a plurality of control signals including control signals for selectively establishing a normal mode and a hands position correction mode of operation, and externally operable correction switch means for producing correction signals;

hands display means comprising time indicating hands and hands advancement means for rotating said hands;

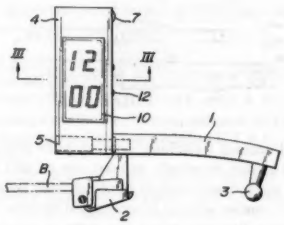
hands drive control circuit means responsive to said control signals and said timekeeping signal in said normal mode for periodically applying drive input signal pulses to said hands advancement means for advancing said hands to thereby indicate time information, and comprising hands position memory circuit means for storing a count value which is periodically incremented by said drive input signal pulses during said normal mode, circuit means acting upon initiation of said hands position correction mode for applying rapid advancement signal pulses simultaneously to said hands advancement means and said hands position memory circuit means, reference time value detection circuit means coupled to said hands position memory circuit means for detecting when the count therein reaches a reference time value and responsive to said detection for acting to terminate application of said rapid advancement signal pulses to said hands advancement means and hands position memory circuit means, said hands advancement means being thereafter responsive to said correction signals for enabling setting of said hands to indicate said reference time value, said hands drive control circuit means being responsive to changeover from said hands position correction mode to said normal mode for applying said rapid advancement signal pulses simultaneously to said hands advancement means and hands position memory circuit means and moreover comprising coincidence detection means operable following the latter changeover for comparing the count value in said hands position memory circuit means with said count value in said timekeeping circuit means and responsive to coincidence being reached therebetween for terminating application of said rapid advancement signal pulses to said hands advancement means and hands position memory circuit means, said hands drive control circuit means acting thereafter to apply said timekeeping signal simultaneously to said hands advancement means and hands position memory circuit means to thereby synchronously update the count value in said hands position memory circuit means and the time displayed by said hands while maintaining said count value in correspondence with said displayed time.

4,536,094

BELT BUCKLE

Keisuke Nagura, No. 12-2, Kotobuki, 1-chome, Daito-ku, Tokyo, Japan

Filed Dec. 8, 1983, Ser. No. 559,224
Claims priority, application Japan, Dec. 9, 1982, 57-185409[U]
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—278 **5 Claims**



1. A belt buckle with a watch unit comprising a dressed plate, a lock fitting secured to one edge of the dressed plate at the rear side thereof for fixing one end of a belt, a pin secured to the other edge of the dressed plate at the rear side for clamping the belt by inserting it in one of a plurality of clamp holes provided at the other end portion of the belt, a rotatable plate pivotally provided to the edge of the dressed plate at the lock fitting side, and a watch unit embedded in the rotatable plate, the rotatable plate comprises a snap clamp, the snap clamp comprises a ball provided to the upper and side edge of the rotatable plate through a second spring in such a manner that a part of the ball is projected from the side edge of the rotatable plate in the closed condition thereof, and a recess provided at the upper and side edge of the dressed plate to receive the projected part of the ball in the closed condition of the rotatable plate.

4,536,095

CROWN SETTING SWITCH FOR A WRISTWATCH

Paul Wuthrich; Lyman R. Daigle, both of Watertown, and Anthony D. Daddona, Waterbury, all of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Sep. 13, 1984, Ser. No. 650,011
Int. Cl.³ G04B *29/00*
U.S. Cl. 368—321 **11 Claims**

1. In a timepiece having a bezel, a time display, circuit means providing timekeeping and displaying time on the time display, and a plurality of internal switch terminals connected to said circuit means for performing switching functions including time setting, the improvement comprising:

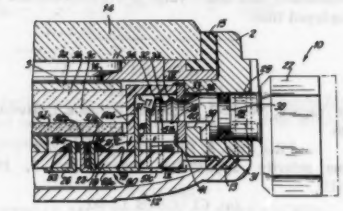
an external crown,

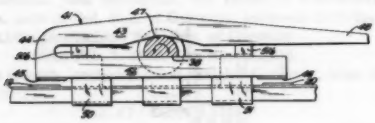
a crown stem attached thereto and extending through an opening in said bezel, said stem defining a plurality of axially spaced detenting grooves, said stem being axially slidable and rotatable about an axis,

a detent rocker contact spring having a spring arm biased into said grooves, means cooperating with said stem to

constrain said spring to rotate therewith, and at least one switch contact arm spaced from the stem rotation axis,

means restraining said detent rocker contact spring against axial movement with respect to the bezel, whereby detenting takes place when the crown is pushed or pulled, and





first and second switching contact pads connected to selected switch terminals, at least one of said contact pads being aligned with and circumferentially spaced from said switch contact arm to be contacted thereby to provide a switching function when the stem is rotated while the stem is in any detenting position.

4,536,096

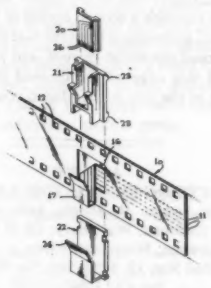
PRINT HEAD CARRIAGE MECHANISM INCLUDING A DRIVE BELT

Terry L. Branson, 1258 Gainsborough, Sunnyvale, Calif. 94087

Filed Dec. 26, 1979, Ser. No. 106,445

Int. Cl.[3] B41J *3/02*; G01D *15/10*

U.S. Cl. 400—120 **3 Claims**



1. A print head carriage apparatus for use in a character printer comprising:

a platen;

first and second rotatable belt guides attached to said printer;

belt means, looped around said belt guides, for supporting and transporting a print head between said belt guides and for precisely aligning said print head with respect to said platen;

drive means, engaging said first belt guide, for rotating said first belt guide to move said belt, thereby transporting said print head between said belt guides;

at least one electrical conductor, united with said belt means, for conveying signals along said belt means to said print heads; and

retainer clip means for detachably securing said print head to said belt means.

4,536,097

PIEZOELECTRICALLY OPERATED PRINT HEAD WITH CHANNEL MATRIX AND METHOD OF MANUFACTURE

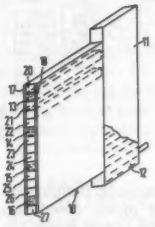
Kenth Nilsson, Akersberga, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 14, 1984, Ser. No. 580,021

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3306098

Int. Cl.[3] B41J *3/04*; G01D *15/18*

U.S. Cl. 400—126 **12 Claims**



1. A piezoelectrically operated print head for a dot matrix comprising; printing nozzles in the form of ink channels each having drive elements, said channels accepting writing fluid from which the writing fluid is ejected drop-by-drop due to piezoelectric deformation of its drive element, said ink channels being formed as a channel matrix that consists of at least one series of strips of piezoelectric material that are disposed parallel to one another at spaced intervals, and including means for electrically contacting said piezoelectric material at both sides, and means for covering said strips at both sides.

4,536,098

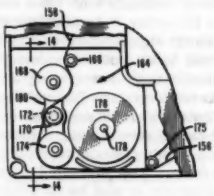
SELF-REGULATING RIBBON RE-INKING DEVICE

Bernard P. Sheehan, Cincinnati, and Volker Werwick, Miamisburg, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 528,867, Sep. 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 374,823, May 4, 1982, abandoned. This application Sep. 18, 1984, Ser. No. 652,157

Int. Cl.[3] B41J *32/02*

U.S. Cl. 400—196.1 **4 Claims**



1. Self-regulating ribbon reinking means in a cassette including an enclosure having a body and a cover therefor, and an endless ribbon within said enclosure, said ribbon re-inking means comprising

means for driving said ribbon for use in printing operations, an

ink supply roll rotatably supported from said body at a fixed location within the enclosure, and

ink transfer means comprising pivot means integral with said cassette body, a carriage comprising a rigid bar, said bar being pivotally mounted at substantially its midpoint on the pivot means, a transfer roll and a balancing roll of substantially identical structure, said balancing and transfer rolls being mounted within the enclosure on opposite ends of said bar, said transfer roll engaging said ink supply roll and serving to transfer ink from said ink supply roll to said ribbon, said ribbon being trained about said transfer and balancing rolls such that tension in said ribbon creates forces acting on said balancing and transfer rolls, the force acting on said balancing roll tending to rotate the carriage in the same sense as the force acting on said transfer roll, said forces created by the tension in said ribbon being substantially the only forces acting to rotate the carriage, a decrease of ink in said ribbon increasing said forces and thus causing said carriage to rotate in a first rotational direction, thereby increasing the contact pressure between the transfer roll and the ink supply roll so that an increased volume of ink flows from said ink supply roll to said transfer roll, and an increase of ink in said ribbon decreasing said forces and causing said carriage to rotate in a second direction, opposite to said first direction, thus decreasing the contact pressure between said transfer roll and said ink supply roll so that a decrease volume of ink flows from said ink supply roll to said transfer roll.

4,536,099

WRITING INSTRUMENT WITH BALL POINT AND TWO RESERVOIRS

Charles P. Kiricoples, Salem; Henry Behrens, Topsfield, and Robert L. Brown, Hingham, all of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Nov. 8, 1983, Ser. No. 550,075
Int. Cl.³ B43K 7/00, 7/08
U.S. Cl. 401—209 **14 Claims**

1. A writing instrument comprising a tubular barrel in association with a writing tip having a rotatably mounted ball, said writing instrument having ink-filled first and second ink reservoirs in fluid communication with each other, the ink in said second ink reservoir also being in fluid communication with said ball and forming a liquid-gas interface with a body of gas contained in said second ink reservoir, the longitudinal distance between the liquid-gas interface and the rotatably mounted ball not exceeding the critical liquid column height for the writing instrument where the critical liquid column height (CLCH) has the following definition:

$$CLCH = \frac{V_s}{2} \sqrt{\frac{2 \times ShL \times \frac{\text{ball weight}}{g}}{\left[\left(\frac{e}{g}\right)(\sqrt{2gh})(V_s)(\pi r^2) - F_{ret.\ min.}\right]}}$$

-continued

$$\text{where } V_s = \sqrt{\frac{E_I}{\frac{e}{g}} \cdot \frac{1}{1 + \frac{2R}{t}\left(\frac{E_I}{E\ \text{wall}}\right)}}$$

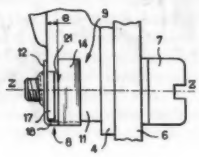
g=acceleration of gravity (i.e. 386 inches/seconds²)
e=ink density (pounds/inch³)
t=pen barrel wall thickness (inches)
2R=wall diameter (inches)
h=drop height (inches)
($\sqrt{2gh}$)=impact velocity (inches/sec.)
E_I=bulk modulus of ink (pounds/inch²)
ShL=socket holding length (i.e. the allowable axial movement of the ball within the ball socket without dislodgment, in inches)
r=radius of the ball (inches)
ball weight=weight of rotatable ball (pounds)
E wall=modulus of elasticity of pen barrel wall (pounds/inch²) and
$F_{ret.\ min.}$=minimum point retention force (pounds).

4,536,100

PART TO BE ASSEMBLED AND SUB-ASSEMBLY COMPRISING SAID PART AND A NUT

Henri Chauviere, Courbevoie, France, assignor to Etudes Techniques et Representations Industrielles E.T.R.I., Neuilly sur Seine, France

Filed Mar. 29, 1983, Ser. No. 480,139
Claims priority, application France, Apr. 2, 1982, 82 05724
Int. Cl.³ B65D 59/00; F16B 33/00
U.S. Cl. 403—12 **8 Claims**



1. A sub-assembly comprising a part to be assembled and a nut, the part to be assembled being provided with a hole therethrough, the hole being surrounded by a boss having an end surface surrounding the outlet of the hole and a side surface surrounding at least partly the hole, the nut comprising a screwing cap facing the end surface of the boss and intended to rest on it, two legs bound up with the screwing cap and receiving between them the side surface of the boss, as well as means for abutment of the nut against the boss in a position of end of insertion along a direction perpendicular to the axis of the hole, wherein the side surface of the boss is provided with at least one projection situated between the end surface of the boss and at least one of the legs of the nut so as to prevent the legs from moving towards the end surface and therefore prevent the nut from getting disengaged from boss.

4,536,101

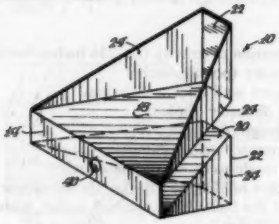
CONNECTOR DEVICE

Dixon J. Jones, P.O. Box 60973, Fairbanks, Ak. 60973

Filed Mar. 30, 1984, Ser. No. 595,430
Int. Cl.³ F16B 7/00
U.S. Cl. 403—389 **9 Claims**

1. A connector for supporting a first member and a second member at right angles, said connector comprising a pair of spaced walls, an end wall connected between said spaced walls and defining an open channel for receiving said first member, a pair of attachment ears connected to and extending away

from said spaced walls at the open end of said channel, said attachment ears having outwardly facing surfaces to abut the second member and to enable securement thereof to the second



member, and pairs of spaced support webs connected between the side edges of the spaced walls and the attachment ears for reinforcing said ears.

4,536,102

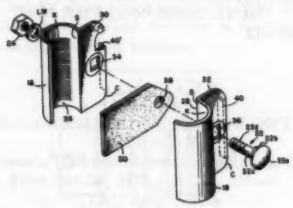
BAR OR ROD OR TUBE FRAME MULTI-POSITION ASSEMBLY CLAMP

Patrick Doyle, P.O. Box 1628, New Rochelle, N.Y. 10802

Filed Mar. 18, 1983, Ser. No. 476,754

Int. Cl.³ F16B *7/04*

U.S. Cl. 403—390 **1 Claim**



1. A multi-positional clamp for securing rods, bars, or tubes of various lengths in fixed positions and at various angles to produce a frame assembly adapted to be covered with a woven fabric or non-woven sheet, which frame assembly may be subject to motion or vibration, and wherein said clamp includes two rigid clamping members adapted to be secured by a carriage bolt assembly and at least one resilient flexible, deformable and cushioning member, said clamp being characterized in that

(a) each of said rigid clamping members comprising

(i) a flat slidable surfaced wide flange portion, each flange portion having on a different one side extending, at right angles, a long, narrow integral flange acting to stiffen each wide flat flange, and having on the same side

(ii) a cradle embracing portion having a relatively large centrally positioned grooved or knurled inner surface surrounded by a relatively narrow smooth marginal surface,

(b) each said flat flange portion having a dished portion formed with a polygonal opening therein for cooperation with a corresponding polygonal shank, integral with and adjacent to the inner face of the head of a carriage bolt of said carriage bolt assembly, including a threaded generally cylindrical portion extending from said polygonal shank so that one of said flat flange portions can be rotated individually about the cylindrical portion of said carriage bolt and so that the second of said flat portions remains relatively stationary because of the engagement of the polygonal shank portion of said bolt with the margin of the polygonal opening therein,

(c) said carriage bolt assembly comprising a carriage bolt having

(i) a head with a flat inner surface from which coaxially extends

(ii) an integral shank having a transverse polygonal cross section from which coaxially extends a threaded cylindrical portion, and a lock washer about or surrounding said threaded portion and an internally threaded nut cooperating with said threaded portion

(d) said bolt assembly and said two clamping members and their respective parts being arranged in series as follows:

(i) first, the inner face of the bolt head contacts the convex or outwardly protruding surface of the dished portion of a flat flange of a first clamping member

(ii) second, the polygonal shank of the bolt extends through the corresponding polygonal opening in said dished portion of said first clamping member

(iii) third, the cylindrical threaded portion of said bolt extends through said deformable and cushioning member and then through the opening in the dished portion of the second clamping member

(iv) fourth, the cylindrical threaded portion extends through a lock washer which on one surface contacts the convex or outwardly protruding surface of the dished portion of the second clamping member and which on its opposite surface contacts the cooperating nut of the bolt assembly which nut is threaded on the corresponding threaded cylindrical portion of said bolt.

4,536,103

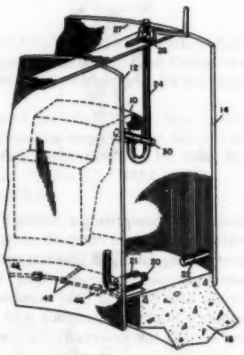
ADJUSTABLE MANHOLE FRAME AND METHOD OF CONSTRUCTION AND INSTALLATION

Everett J. Prescott, P.O. Box 600, Gardiner, Me. 04345

Continuation-in-part of Ser. No. 425,946, Sep. 28, 1982, which is a continuation-in-part of Ser. No. 263,065, May 13, 1981, which is a continuation-in-part of Ser. No. 180,394, Aug. 22, 1980, abandoned. This application Aug. 16, 1983, Ser. No. 523,743

Int. Cl.³ E02D *29/14*; B29C *1/12*

U.S. Cl. 404—26 **19 Claims**



1. A frame disposable in surmounting relation to a manhole cone to define a manhole opening at pavement level, the opening being closable by a manhole cover, the frame further being capable of adjustment relative to the cone and to the pavement level, comprising:

a body member having a centrally disposed opening defined at least in part by an inner skirt portion which extends substantially about the periphery of the opening, the body member having a planar upper surface normally disposed horizontally when installed relative to the cone, that por-

tion of the planar upper surface proximate to and surmounting the inner skirt portion being recessed into the body member about the perimeter of the opening to define a peripheral seat for receiving and supporting the edges of the manhole cover, the body member further having an outer skirt portion spaced from the inner skirt portion and extending downwardly from the planar upper surface and substantially about the outer perimeter of the body member, at least a portion of the lower surface of the body member between the inner and outer skirt portions being arcuate and defining an arch-like channel disposed between at least portions of the inner and outer skirt portions, innermost surfaces of the channel having a slope which is angled relative to a line taken perpendicularly to the planar upper surface of the body member to facilitate installation and adjustment of the height of the frame relative to the manhole cone.

9. A method for installing a frame in surmounting relation to a manhole cone to define a manhole opening at pavement level, comprising the steps of:

disposing a form in the opening of the manhole cover;

suspending the frame in place relative to and substantially about the outer perimeter of the form in spaced relation to the form;

adjusting outer contours of the form to expand the form to contact the form with the frame and thus support the frame in place in surmounting relation to the cone;

filling in spaces between upper portions of the cone and lower portions of the frame to support the frame relative to the cone; and,

removing the form.

4,536,104

PIPE DIVIDER FOR PIPES CONVEYING SOLIDS

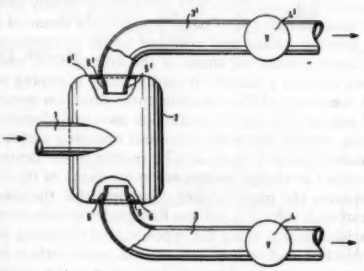
Theodor Büngert, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,515

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1983, 3305078

Int. Cl.³ B65G *53/56*

U.S. Cl. 406—183 **9 Claims**



1. A pipe divider for pipes which are intended for conveying solids for small particle size, comprising:

(a) a distributor chamber comprising a substantially axially extending enclosed space having generally curved side walls;

(b) a feed pipe running essentially tangentially into said chamber;

(c) at least two distributor pipes communicating with said chamber;

(d) means for preventing blockage of said distributor pipes; and

(e) shut-off means, located in each of said distributor pipes for selectively closing said distributor pipes to flow,

wherein said means for preventing blockage of the distributor pipes comprises a radially inwardly-curved weir around the inlet point to each of said distributor pipes.

4,536,105

PIPE DIVIDER FOR PIPES CONVEYING SOLIDS OR DISPERSIONS

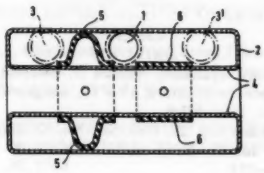
Theodor Büngert, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,462

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1983, 3305079

Int. Cl.³ B65G *53/56*

U.S. Cl. 406—183 **7 Claims**



1. A pipe divider for pipes used to convey solids of small particle size or dispersions, comprising:

a generally cylindrical distribution chamber;

a feed pipe leading essentially tangentially into distributor chamber;

two distributor pipes leading essentially tangentially away from said distribution chamber;

an internal cylinder, located within said distributor chamber;

two flexible, inflatable tubes located within said distributor chamber, such that a first tube is situated between the feed pipe and a first distributor pipe, and a second tube is situated between the feed pipe and a second distributor pipe, said tubes being mounted in such a manner that they surround the internal cylinder; and

means for selectively pressurizing each of said tubes for selectively blocking either one or both of the two distributor pipes.

4,536,106

HEAVY DUTY HOB

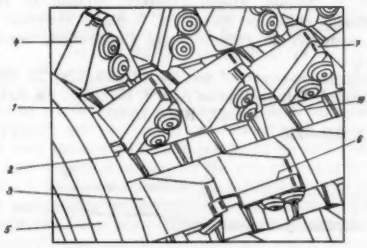
Walter Zorn, Pforzheim, Fed. Rep. of Germany, assignor to Walztechnik Saacke Zorn GmbH & Co., Pforzheim, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,289

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241696

Int. Cl.³ B23F *21/16*

U.S. Cl. 407—25 **3 Claims**



1. High efficiency hobbing cutter for producing gears, said hobbing cutter comprising a cylindrical body having generally axially extending grooves and tooth carrying bars which are

inserted in the grooves, means for retaining said bars in said grooves, said bars having teeth forming a helical array around the body, the improvement wherein a leading edge of each tooth is provided with an angle section groove extending generally radially outwardly of said cutter body, a reversible cutter insert having a cutting tip disposed in each said angle section groove, clamp means securing said insert in said angle section groove, said cutter insert having a rectangular cross-section, said angle section groove being inclined with respect to axial and radial directions of said cylindrical body whereby said angularly oriented angle section groove supports said cutter insert to provide a side clearance and an end clearance to improve the cutting performance of the cutting tip and a helical groove extending axially around said cylindrical body adjacent said helical array, one end of each of said inserts being supported in said groove.

4,536,107

DRILL BIT

Julius W. Sandy, Sycamore; William D. Riebock, and Billy J. Bauscher, both of Rockford, all of Ill., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Aug. 29, 1983, Ser. No. 527,590
Int. Cl.³ B23B *51/02*; B27G *15/00*
U.S. Cl. 408—214 **14 Claims**

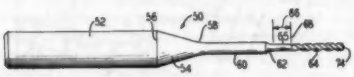
1. A drill bit for drilling a hole of selected diameter in a workpiece, said bit having a working end comprising a cylindrical portion with a selected cutting diameter and a conical threaded portion extending from the cylindrical portion and terminating in a tip, the diameter of the threaded portion increasing from the tip toward the cylindrical portion and approaching the diameter of the cylindrical portion at their juncture, said working end including at least one flute means through the threaded portion and through the cylindrical portion forming a longitudinally extending cutting edge and another edge on the threaded portion and on the cylindrical portion, whereby said threaded portion pulls the bit into the workpiece in a self-feeding effect while the cutting edge thereof cuts a progressively increasing diameter hole in the workpiece and the cutting edge of said cylindrical portion provides the finish cut for the final selected diameter hole, said conical threaded portion having peripheral threads extending from the cutting edge around said conical threaded portion except for said flute means with said threads reduced in height or eliminated adjacent said another edge.

4,536,108

FLEXIBLE MICRODRILL

Robert W. Saxton, Mount Prospect; William R. Hewitt, Clarendon Hills, and Jerome M. Nelligan, Matteson, all of Ill., assignors to Federal-Mogul Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 497,069, May 23, 1983, abandoned. This application Aug. 8, 1983, Ser. No. 521,338
Int. Cl.³ B23B *51/00*
U.S. Cl. 408—230 **15 Claims**



1. In a microdrill of the type which comprises a drill body of predetermined diameter including a cutting tip and helical flutes extending along said drill body from said cutting end to a flute terminus location, a shank to be engaged and rotated about a longitudinal axis by a drilling machine, and a frusto-conical section connecting said shank and said drill body and forming a high stress location at such connection, the improvement therein comprising:

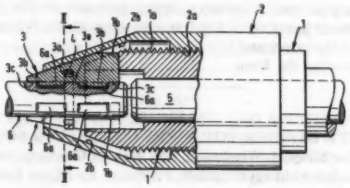
an additional, flexible, intermediate section between and connecting said frusto-conical section and said drill body and having a length at least greater than said predetermined diameter and spacing said flute terminus location from said frusto-conical section to provide spacing of the drill body from said high stress location, and to provide flexing of said microdrill in said intermediate section, at least the frustoconical section, the intermediate section and the drill body being composed of a unitary structure.

4,536,109

DRILL CHUCK FOR PERCUSSION DRILLING

Josef Hunger, Olching, and Anton Neumaier, Fürstenfeldbruck, both of Fed. Rep. of Germany, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Mar. 7, 1984, Ser. No. 587,190
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 3310146
Int. Cl.³ B23B *31/12*
U.S. Cl. 408—240 **6 Claims**



1. Chuck for a drilling device for use as a rotary drilling device or a rotary/percussion device, such as a hammer drill, comprising means forming a chuck housing having a central axis and arranged to receive the shank of a drilling tool removably mounted in said chuck and extending generally along the central axis, clamping jaws radially adjustably mounted in said chuck housing means and arranged to be circumferentially spaced apart around the shank of the drilling tool, each said clamping jaw has a radially inwardly facing clamping surface shaped concavely in the circumferential direction around the central axis, at least one projection on each said clamping jaw extending radially inwardly from said clamping surface, said projections extending in the axial direction of the central axis and arranged to engage in recesses in the shank of the drilling tool, wherein the improvement comprises that the clamping surface of each clamping jaw has first guide surfaces extending in the axial direction along the opposite axial extending sides of said projection and at least one second guide surface section extending transversely of the axial direction of the central axis along one of the ends of said projection spaced apart in the axial direction of the chuck.

4,536,110

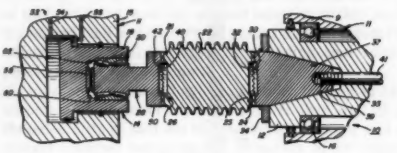
SELF CENTERING QUICK-CHANGE CUTTING TOOL ASSEMBLY

W. James Farrell, Kildeer, and Werner K. Diehl, Rolling Meadows, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 17, 1984, Ser. No. 581,170
Int. Cl.³ B23F *5/20, 21/16*
U.S. Cl. 409—11 **11 Claims**

1. A tool mounting assembly for a gear hobbing machine or the like having a drive spindle and an outboard bearing support in axial alignment with said drive spindle, said tool mounting

assembly comprising a first coupling unit for detachable connecting one end of a hob in driving engagement with said drive spindle, and a second coupling unit for detachable connecting the other end of said hob to said outboard bearing support, said first coupling unit including a first portion secured in driving relation to the distal end of said drive spindle and a second portion secured to the outer end face of said one end of said hob, said first and second portions including radially disposed teeth which cooperatively intermesh in a disengageable manner for self-centering said one end of said hob relative to said drive spindle and an outboard support unit including a plunger rotatably mounted in said bearing support and axially movable



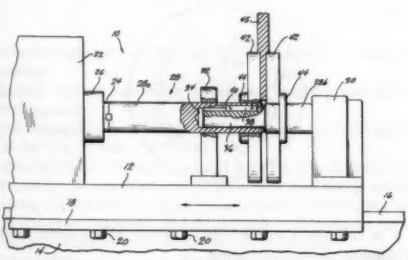
between a hob coupling position and an unload position, and said outboard support unit having a drive means for selectively moving said plunger between said hob coupling and unload positions, said second coupling unit including a first portion secured to the other end of said hob and a second portion secured to said plunger, said first and second portions of said second coupling unit including axial nesting means for self centering said other end of said hob, said plunger drive means providing sufficient end thrust on said plunger when in said hob coupling position to maintain said hob concentric with the axis of said drive spindle and to hold said first and second portions of said first coupling unit in rigid driving intermeshing relationship.

4,536,111

MACHINE TOOL HAVING NUMERICALLY CONTROLLED ADJUSTABLE ARBOR SET UP FOR STRADDLE MILLING

Ervin J. Kielma, West Allis, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Jun. 7, 1982, Ser. No. 385,906
Int. Cl.³ B23C *1/02, 7/00*
U.S. Cl. 409—80 **3 Claims**



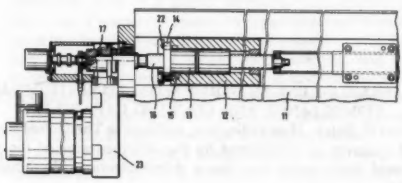
1. In a machine tool having a rotary spindle movable axially and numerically controlled, cutting apparatus comprising:
a frame;
an arbor support carried on said frame;
a first arbor member coupled to the spindle for rotation therewith and movable axially therewith;
a second arbor member in axial alignment with said first arbor member rotatably supported by said arbor support and fixed against axial movement;
a reduced diameter end on one of said arbor members for reception in an axial bore formed in the other of said arbor members so that said first arbor is movable axially relative to said second arbor while maintaining said arbors in precise axial alignment,
means on said reduced diameter end for coupling said second arbor member to said first arbor member for rotating said first and second arbor members in unison;
a first cutter fixedly mounted on said first arbor member for rotation therewith and movable axially therewith; and
a second cutter mounted on said second arbor member for rotation therewith in axial alignment and spaced apart relationship with said first cutter so that said first and second cutters can operate simultaneously on a single workpiece.

4,536,112

PROTECTION DEVICE AGAINST OVERLOADS IN A MACHINE

Anton Horsky, Göppingen; Siegfried Kuhn, Dürnau, and Wolf-Dietrich Voss, Boll, all of Fed. Rep. of Germany, assignors to Oerlikon-Boehringer GmbH, Göppingen, Fed. Rep. of Germany

PCT No. PCT/EP82/00212, § 371 Date May 20, 1983, § 102(e) Date May 20, 1983, PCT Pub. No. WO83/01030, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 22, 1982, Ser. No. 499,150
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137878
Int. Cl.³ B23B *21/00*
U.S. Cl. 409—134 **8 Claims**



1. In a machine tool having a machine bed, a carriage carried on said machine bed, a lead screw for reciprocating said carriage on said machine bed, a flange and a lead screw nut connected to the flange and connecting said lead screw to said carriage; an overload protecting device comprising: at least one first connecting screw connecting said flange to said carriage, and at least one second connecting screw connecting said flange to said nut, each of said connecting screws having a break-away section.

4,536,113

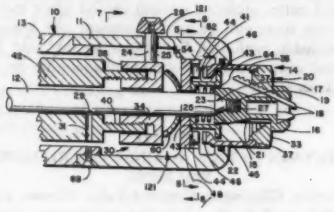
AUTOMATIC JAW CONTROL FOR REVERSIBLE POWER TOOL

Jim J. Hatfield, 2723 Species La., Redondo Beach, Calif. 90278

Continuation-in-part of Ser. No. 358,030, Mar. 15, 1982,. This application May 2, 1983, Ser. No. 490,857
Int. Cl.³ B23Q *3/12*; B23B *31/24*
U.S. Cl. 409—234 **5 Claims**

1. In a reversible power tool having a rotary drive shaft carried by a drill housing and having a chuck engageable for rotation with said drive shaft and formed with a jaw guide, chuck jaws constrained by said jaw guide for radial advancement and retraction relative to the axis of said drive shaft, chuck jaw reciprocating means journaled relative to said jaw guide, and coupled to said chuck jaws to selectively advance and retract said chuck jaws between completely advanced and completely retracted positions when said chuck jaw reciprocating means and said jaw guide are subjected to relative rotation in opposite directions, and manually actuable clutch means for engaging and disengaging said chuck jaw reciprocating means relative to said drill housing to respectively allow

and prevent relative rotation between said jaw guide and said chuck jaw reciprocating means, wherein said clutch means includes a clutch actuator mounted for movement relative to said drill housing, clutch interface means for engaging said drill housing to said chuck jaw reciprocating means, biasing means urging said clutch interface means into disengagement



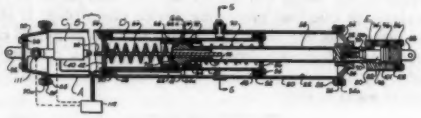
and actuable coupling means for overcoming said biasing means and moving said clutch interface means into engagement at a mechanical advantage by said clutch actuator, the improvement comprising decoupling means for forcing said clutch interface means into disengagement as said chuck jaws approach said completely retracted position despite actuation of said coupling means.

4,536,114

VARIABLE LENGTH STRUT WITH LONGITUDINAL COMPLIANCE AND LOCKING CAPABILITY

Robert R. Belew, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 1, 1983, Ser. No. 510,137
Int. Cl.³ F16M *13/00*
U.S. Cl. 410—156 **12 Claims**



6. A variable length strut device comprising:

an outer load bearing shell having a first end adapted for connection to a first associated structure;

a strut connection rod slidably carried by said shell having a free end adapted for connection to a second associated structure;

a compliance assembly including a housing slidably carried in said shell;

said strut rod having a second end remote from said free end slidably received within an interior of said compliance assembly housing;

biasing means acting on said second end of said strut rod resisting movement of said strut in either one of two opposing directions when operating in a compliance mode;

drive means positioning said compliance assembly housing longitudinally in said shell; and

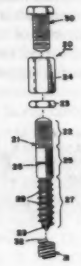
locking means for locking said strut rod in a longitudinal position when operating in a locked mode wherein said strut rod is prevented from sliding longitudinally relative to said shell.

4,536,115

ANCHOR APPARATUS FOR INSERTION INTO A PRE-FORMED HOLE

J. Frank Helderman, 414 S. Maple St., Graham, N.C. 27253

Filed Jun. 30, 1982, Ser. No. 393,668
Int. Cl.³ F16B *13/00*
U.S. Cl. 411—17 **21 Claims**



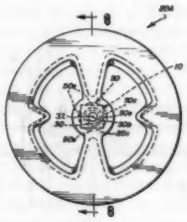
1. Anchor apparatus for insertion into a pre-formed hole for permanent embedment into the walls of the hole comprising in combination: a non-resilient coil, a lag member, said lag member including a threaded portion having threads with substantially uniform helix and flank angles, said coil releasably engaging said lag member, said coil expandable from a relaxed to an elongated posture, said coil having a plurality of turns, two of said plurality of turns being oppositely positioned end turns, one of said end turns being provided with a curved lead-in end portion that comprises a portion of the turn that is helically and radially expanded relative to the other turns when said coil is in the relaxed position.

4,536,116

COMPOSITE MOLDED PLASTIC ARTICLE

Pierre C. Murray, Buffalo Groove, Ill., assignor to MacLean-Fogg Company, Mundelein, Ill.

Filed Nov. 7, 1983, Ser. No. 549,173
Int. Cl.³ F16B *37/00, 37/14*
U.S. Cl. 411—82 **11 Claims**



1. A composite molded plastic article with a metal nut insert molded in place, comprising:

a body of molded plastic material, adapted to be formed in a mold having a pin projecting into a mold cavity used for making said article; and

a nut insert having a central threaded bore adapted to be mounted on said pin within said cavity while said body is molded around surfaces thereof,

said bore extending between a pair of opposite, parallel planar faces having a polygonal outline and including a first pair of opposite side edges normal to said planar faces comprising substantially planar surfaces, and a second pair of opposite side edges normal to said faces and angularly intersecting said first pair of edges said second side edges having a longitudinally extending, groove receiving said

molded plastic material and positioned between planar faces,

recess means in said body aligned axially of said threaded bore of said nut insert adjacent a planar face thereof spaced inwardly of an outer surface of said body for accommodating an overdriven threaded element engaged in said bore of said nut insert,

said recess means comprising a nut holding insert molded in place in said body and having means for engaging and holding said nut insert in place in said mold cavity,

said nut holding insert comprising a cup shaped member made of plastic material and said holding means thereof including wall portions engaging said opposite side edges of said nut insert, said cup shaped member further including an end wall and a stop wall spaced parallel thereof and adjacent said wall portions for engaging said adjacent planar face of said nut insert,

said cup shaped member having a circular transverse cross-section with an inner diameter greater than that of said threaded bore of said nut insert, said end wall of said cup shaped member being spaced inwardly of an adjacent outside surface of said body of said article, and

said end wall of said cup shaped member including a central spacer having an outer surface aligned with said outside surface of said body of said article.

4,536,117

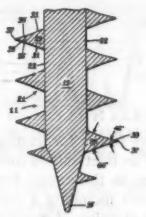
SCREW FASTENER

Ernest Yamashiro, Skokie, Ill., assignor to Mid-Continent Screw Products Company, Lincolnwood, Ill.

Continuation of Ser. No. 325,637, Nov. 30, 1981, abandoned. This application Jun. 18, 1984, Ser. No. 621,146

Int. Cl.³ F16B *25/00*

U.S. Cl. 411—411 **3 Claims**



1. A self-tapping screw fastener for driving into a workpiece comprising:

generally cylindrical shank having an entering end and a trailing end;

a tool-engagable head integrally joined with the trailing end of the shank; and

an external helical thread, integral with the shank, forming a plurality of convolutions substantially uniformly spaced along the axis of the shank so as to leave a helical portion of the shank exposed, the thread being adapted for forming a complementary thread in the workpiece;

the helical thread having a double angle thread profile determined by a transverse cross section of the thread and defined by a base portion and a crest portion;

the base portion of the helical thread being adjacent the shank and having a trapezoidal cross-section defined by a first pair of converging, spaced-apart flank surfaces that define a first included angle of about 60°;

the crest portion of the helical thread being adjacent the base portion, and having an isosceles triangular cross-section defined by a second pair of flank surfaces that converge to a sharp cutting edge to facilitate forming the complementary thread in the workpiece by making a cut therein and define a second predetermined included angle of about 45°;

the first predetermined included angle being greater than the second predetermined included angle; and

the height of the helical thread being substantially uniform along the generally cylindrical shank but tapering to zero along the entering end so that when the screw is driven into the workpiece the low angle crest leads the entry of the base portion into the workpiece.

4,536,118

APPARATUS FOR PALLETIZING PRESSINGS

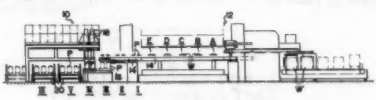
Kiyokazu Baba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,327

Claims priority, application Japan, May 17, 1982, 57-81615

Int. Cl.³ B65H *31/30, 31/32*

U.S. Cl. 414—43 **9 Claims**



1. A materials handling system for separating, sorting and stacking fabricated parts comprising:

(a) a transfer means for conveying fabricated parts away from a fabricating device;

(b) a separating means receiving said fabricated parts from said transfer means comprising a means for separating said fabricated parts in a lateral direction with respect to a direction of transfer, a means for separating said fabricated parts in a longitudinal direction with respect to said direction of transfer and a means for conveying said parts during and after separation away from said transfer means;

(c) a wheeled carriage having at its upper surface a plurality of parallel receiving bars or plates and adapted to receive said fabricated parts from said separating means;

(d) a lifting means situated beneath said carriage when said carriage is in a position to receive fabricated parts from said separating means, said lifting means being capable of raising said carriage to a point for reception of said fabricated parts from said separating means and lowering said carriage in a step-wise fashion so as to cause said fabricated parts to be stacked vertically upon said carriage;

(e) an intermediate collection means interposable between said separating means and said carriage and adapted to receive a limited number of said fabricated parts;

(f) one or more moveable overhead loading means comprising one or more overhead rails, a frame engaging said one or more of said overhead rails, depending arms projecting downward from said frame, and foldable end members pivotally attached to an end of said depending arms opposite to said frame, said overhead loading means being adapted to remove said stacked fabricated parts from said carriage;

(g) loading stations at one or more locations situated beneath said overhead rails where said fabricated parts are discharged from said overhead loading means onto pallets; and

(h) means for supplying and removing said pallets from said loading stations.

4,536,119

PALLETIZING APPARATUS WITH LAYER LEVEL DETECTING MEANS

Leonard Miaskoff, Plattsburgh, N.Y., assignor to Harris Corporation, Melbourne, Fla.

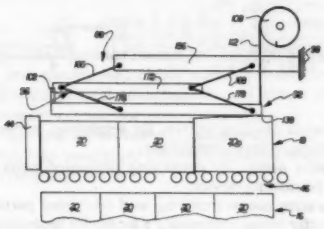
Filed Sep. 28, 1982, Ser. No. 425,611

Int. Cl.³ B65G *57/06*

U.S. Cl. 414—100 **5 Claims**

1. An apparatus for sequentially loading a plurality of layers of bundles of newspapers onto a pallet, said apparatus compris-

ing retractable floor means for supporting each layer of bundles in turn over the pallet, said floor means being movable from a closed position supporting a layer of bundles to a retracted position to drop a layer of bundles through an opening in said floor means onto the pallet, elevator means for lowering the pallet with the layer of bundles on the pallet, indicator means for engaging the top of and moving downwardly through the opening in said floor means with the layer of bundles, detector means for detecting when said indicator means has moved to a predetermined position in which the laver of bundles is beneath said floor means when said floor means is in the closed position, and control means for interrupting operation of said elevator means to stop the lowering of the pallet in response to said detector means detecting that said indicator means has moved to the predetermined position, said indicator means including a frame overlying at least a major portion of each of the bundles of newspapers in the layer of



bundles and movable downwardly with the layer of bundles through the opening in said floor means, linkage means connected with said frame for maintaining said frame in a horizontal orientation in engagement with the layer of bundles during downward movement of the layer of bundles, said linkage means comprising a first linkage connected with a first side of said frame and a second linkage connected with a second side of said frame, said first and second linkages each including a base, a pair of parallel upper links having upper end portions pivotally connected with the base, a horizontal connector link pivotally connected with lower end portions of said upper links, and a pair of parallel lower links having upper end portions pivotally connected with said connector link and lower end portions pivotally connected with said frame, and lift means connected with said frame at a location between said first and second linkages for raising said frame from a location beneath said floor means to a location above said floor means while said floor means is in the open position.

4,536,120

FEEDING MEANS FOR FEEDING SOLID FUEL FROM A STORAGE SILO OR EQUIVALENT INTO A SOLID FUEL HEATING BOILER

Pasi Kylmänen, and Pasi Takalo, both of Finnish, Finland, assignors to Saastamoinen Oy, Finland

PCT No. PCT/F181/00033 § 371 Date Dec. 27, 1982, § 102(e) Date Dec. 27, 1982, PCT Pub. No. WO82/04113, PCT Pub. Date Nov. 25, 1982

PCT Filed May 14, 1981, Ser. No. 459,632

Int. Cl.[3] F23K *3/00*

U.S. Cl. 414—173 **12 Claims**

1. Feeding means for feeding solid fuel from a storage silo to a heating boiler, said feeding means comprising

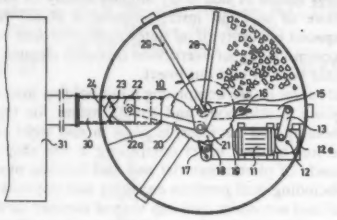
piston means adapted to move reciprocatingly,

tube means communicating with the heating boiler and in which said piston means is disposed,

aperture means communicating said tube means with the storage silo,

vane means rotatably disposed within a lower portion of the storage silo to effectuate delivery of the solid fuel from the storage silo to the boiler through said tube means, said vane means comprising a substantially rigid portion, and a turnable portion, and

hinge means for interconnecting said turnable and substantially rigid portions of said vane means, said hinge means



comprising a hinge axle substantially parallel with a longitudinal axis of said substantially rigid portion of said vane means.

4,536,121

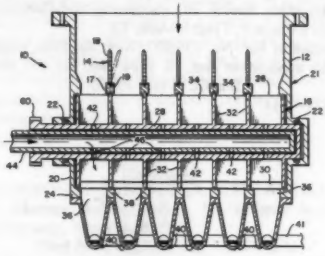
DIVIDED ROTARY VALVE FEEDER

Robert D. Stewart, Verona, and Robert L. Gamble, Wayne, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Apr. 22, 1983, Ser. No. 487,654

Int. Cl.[3] B65G *53/40*

U.S. Cl. 414—219 **17 Claims**



1. A rotary valve feeder for feeding material, comprising:

a casing having an inlet and an outlet;

a rotor mounted in the casing between the inlet and the outlet, the rotor including a plurality of vanes defining troughs and a plurality of partitions dividing each trough into a plurality of compartments;

means for defining a plurality of passages in the outlet; and

means in said inlet for defining a plurality of channels, said channel defining means being adjustable to vary the relative sizes of the channels with respect to one another in order to evenly divide the material among the compartments of the rotor.

16. Apparatus for evenly distributing material across an area subject to pressure variations comprising:

a casing having an inlet and an outlet;

a plurality of conveyors in communication with said casing outlet and said area subject to pressure variations, each conveyor moving the material to a respective predetermined portion of said area;

means for defining a plurality of passages in said casing outlet, each conveyor being in sealed communication with a respective one of said passages; and

a rotor mounted in said casing between said inlet and said outlet, said rotor having an axis and a plurality of troughs parallel to said axis and registrable with more than one of said passages, said rotor further having means for dividing said troughs into a plurality of compartments, wherein each compartment is in registration with a respective one of said passages said trough dividing means being in sealing engagement with said means for defining a plurality of passages in said outlet in order to prevent the material

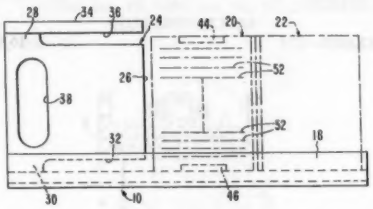
from being blown along said troughs and between said compartments.

4,536,122

WAFER TRANSFER DEVICE

John M. Herrmann, Santa Clara, and Suzanne M. Voisin, Fremont, both of Calif., assignors to Trilogy Computer Development Partners, Ltd., Cupertino, Calif.

Filed Aug. 22, 1983, Ser. No. 525,195
Int. Cl.³ B65G *65/00*
U.S. Cl. 414—404 **10 Claims**



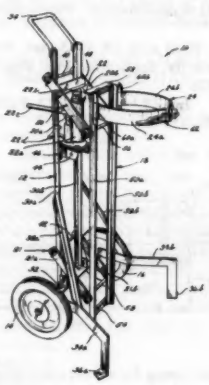
1. A wafer transfer device for a pair of wafer carriers of the type having aligned side grooves for receiving a number of wafers and front and rear openings with only a first of the openings being wide enough to allow the wafers to enter and leave the wafer carrier, said device comprising: a base having an upper surface; and a wall member secured to the base and extending upwardly therefrom; said surface adapted to support a pair of wafer carriers with the first openings thereof abutting each other and with the grooves of the wafer carriers aligned with each other, said wall member adapted to enter the other opening of the adjacent wafer carrier as the wafer carriers move over the surface toward the wall member, so that the wafers will be shifted by the wall member from the grooves of the first wafer carrier to the grooves of the second wafer carrier.

4,536,123

HAND TRUCK APPARATUS FOR ELEVATING AND TRANSPORTING AN OBJECT

Wayne E. Snyder, 11122 Township Rd. 180, Findlay, Ohio 45840

Filed Aug. 4, 1983, Ser. No. 520,411
Int. Cl.³ B60P *1/00*
U.S. Cl. 414—448 **6 Claims**



1. A hand truck apparatus for elevating and transporting an object comprising:

a main frame assembly having ground engaging wheel means;

a load supporting mechanism movably mounted on said main frame assembly, said load supporting mechanism being movable between a first lower position and a second upper position, said load supporting mechanism including a generally elongate frame member for engaging the object along a first predetermined length of the sidewall of the object, said load supporting mechanism including securing means for engaging a portion of the sidewall of the object along a second predetermined length of the sidewall of the object, said securing means urging the object into secure engagement with said elongate frame member, said first predetermined length being greater than said second predetermined length; and

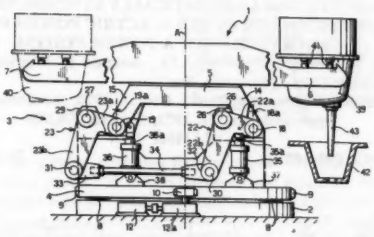
means for moving said load supporting mechanism and the object between the first lower position and the second upper position.

4,536,124

REVOLVING-LADLE TURRET FOR CONTINUOUS CASTING STEEL PLANTS

Oreste Silvestri, Segrate, Italy, assignor to Innse Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Sep. 28, 1982, Ser. No. 425,653
Claims priority, application Italy, Oct. 2, 1981, 24274 A/81
Int. Cl.³ B66C *1/44*
U.S. Cl. 414—744 R **1 Claim**



1. Revolving-ladle turret comprising:

a turret member having diametrically opposed arms for carrying ladles;

a platform for supporting said turret member;

a pair of linkage means for interconnecting said turret member and said platform, each of said linkage means comprising a pair of bell cranks and a horizontally-extending rod interconnecting lower ends of the bell cranks, each bell crank having an upper end connected to said turret member and a portion intermediate the ends connected to said platform so that said bell crank is pivotable about the connection to said platform;

means for vertically moving said turret member with respect to said platform;

a base for supporting said platform for rotation about a vertical axis; and

means for rotating said platform about the vertical axis.

4,536,125

WIND LIFT GENERATOR

George R. Herman, 2134 S. Bonarden La., Tempe, Ariz. 85282, and William A. Martin, Elma, Wash., assignors to George R. Herman, Tempe, Ariz.

Filed Apr. 25, 1983, Ser. No. 488,536
Int. Cl.³ F03D *5/02*
U.S. Cl. 415—5 **24 Claims**

1. A fluid power generator comprising:

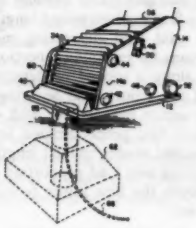
a support frame,

a plurality of coaxially disposed pairs of support and drive

sprockets rotatably mounted in spaced relations on said frame,

a pair of spaced apart endless chains mounted on separate ones of said pairs of said sprockets, and

a plurality of fluid responsive lift blades mounted on and



extending between said chains, said sprockets being positioned to define a first lift stage of said blades followed by an impact stage, and a downward lift stage, and a neutral stage on said support frame to be oriented by said support into a predetermined fluid stream wherein each of said stages presents a plurality of blades to said fluid stream.

4,536,126

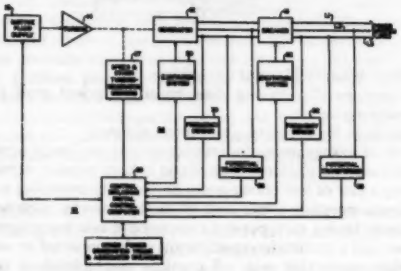
SYSTEM AND METHOD EMPLOYING A DIGITAL COMPUTER FOR AUTOMATICALLY SYNCHRONIZING A GAS TURBINE OR OTHER ELECTRIC POWER PLANT GENERATOR WITH A POWER SYSTEM

John F. Reuther, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 99,491, Dec. 18, 1970, abandoned. This application Jul. 31, 1972, Ser. No. 276,508

Int. Cl.[2] H02P *9/04*

U.S. Cl. 290—40 R **21 Claims**



1. A system for operating an electric power plant comprising an electric generator, a prime mover for driving said generator, a circuit breaker for connecting the electric output of said generator to an external power system, a plant control system including means for controlling prime mover motive fluid flow, said control system including a digital control computer, means for determining a computer representation of the magnitude and rate of change of said generator output and the external system phase difference as a function of time, said control system providing a loop for controlling prime mover speed in response to a speed reference, means for operating said computer within said speed control loop at least to generate a representation of said speed reference at least during startup operations, means for operating said computer to modify said speed reference representation as a function of said phase difference representation, means for operating said computer to generate a breaker closure command when said phase difference representation reaches a predetermined condition, and means for operating said breaker in response to said closure command.

4,536,127

TURBOCOMPRESSOR PROVIDED WITH AN ABRADABLE COATING

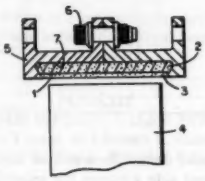
Axel Rossmann, Karlsfeld, and Herbert Merz, Munich, both of Fed. Rep. of Germany, assignors to Motoren-Und Turbinen-Union, Munich, Fed. Rep. of Germany

Filed May 1, 1984, Ser. No. 605,773

Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316535

Int. Cl.[3] F16J *15/16*

U.S. Cl. 415—174 **16 Claims**



1. In a turbocompressor having a rotatable element comprising a rotor including rotor blades, a stationary element comprising a stator including stator vanes and a casing, and a member with an abradable coating interposed between the rotatable and stationary elements, said abradable coating facing the rotor blades such that the rotor blades come into initial contact with the coating to produce a minimal clearance therewith, the improvement wherein said member with the abradable coating comprises a first layer of carbon-reinforced graphite and a second layer comprised solely of graphite, said first layer being supported by one of said elements with said second layer facing the other of said elements to be abraded upon relative rotation of said elements to establish the minimal clearance therebetween.

4,536,128

BARREL HOUSING FOR CENTRIFUGAL FLUID MACHINES

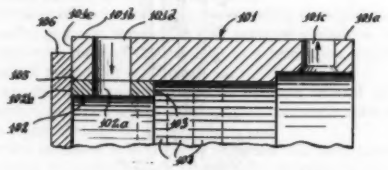
Günter Feldle, St. Leon-Rot, and Klaus Fischer, Neustadt, both of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Filed Aug. 10, 1983, Ser. No. 522,059

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1982, 3232326

Int. Cl.[3] F04D *29/42*; B23K *31/02*

U.S. Cl. 415—219 C **19 Claims**



1. An outer casing for a fluid-conveying unit of a centrifugal fluid machine, particularly for a multistage pumping unit of a centrifugal pump, comprising a tubular main section having a first and a second end portion; an annular second section at least partially installed in said main section, said second section

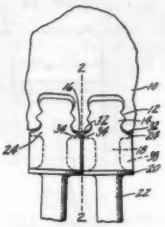
having an end face facing one of said end portions, and said end face constituting an abutment for the fluid-conveying unit of the centrifugal fluid machine, said main and second sections constituting two different bodies; and means for securing said second section to said main section, said securing means including a permanent bond between said sections.

4,536,129

TURBINE BLADE WITH DISK RIM SHIELD

Alan L. Jankot, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 15, 1984, Ser. No. 621,275
Int. Cl.³ F01D *5/08*
U.S. Cl. 416—95 **5 Claims**



1. A turbine blade having
an airfoil section,
a platform at the inner end of the airfoil section,
a shank extending from the platform from the side opposite to the airfoil section,
opposed flanges extending outwardly in substantially parallel relation to the platform at the end of the shank, and
a blade root immediately at the end of the shank on the other side of the flanges, said opposed flanges being of such a dimension that when the blade is assembled on the disk, the flanges of adjacent blades will be closely adjacent to one another and closely overlying and in spaced relation to the rim of the disk to form an axial air passage at said rim.

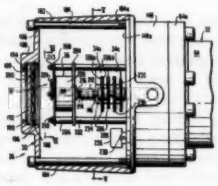
4,536,130

SIMPLIFIED UNLOADER INDICATOR FOR HELICAL SCREW ROTARY COMPRESSOR

Salvatore Orlando, South Windsor, and David R. Martin, Torrington, both of Conn., assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed Jun. 18, 1984, Ser. No. 621,653
Int. Cl.³ F04B *21/00*; G01D *11/00*
U.S. Cl. 417—63 **5 Claims**

1. In a helical screw rotary compressor for a gas compression system, said compressor having:
an axially shiftable unloader slide valve for varying the capacity of the compressor,
an unload cylinder mounted to said compressor and including a reciprocating piston and defining with said cylinder fluid sealed chambers on opposite sides of said piston,
a piston rod mounted to said piston at one end and mounted to said slide valve at the other end;
whereby the application and removal of a compressed fluid to and from said chambers causes said piston to reciprocate said slide valve between full load and full unload positions and vice versa,
the improvement wherein:
said piston rod is hollow,
and wherein said compressor further comprises an indicator shaft positioned coaxially within said hollow rod,
means for mounting said indicator shaft for rotation about its axis and for preventing shaft axial movement,
an indicator pin fixedly mounted to one of said rod and said shaft and extending radially therefrom,
a helical groove formed within the other of said rod and shaft, facing said pin and receiving a radially projecting portion of said pin,
means operatively engaging said indicator shaft and responsive to rotation of said indicator shaft for at least indicating the position of the slide valve and the load/unload condition or said compressor,
and wherein said compressor further comprises; a compressor housing, parallel bores formed within said housing for receiving intermeshed helical screw rotors, a recess within said housing opening to said bores, said slide valve being positioned within said recess for reciprocating movement therein, a bulkhead closing off one end of said unload cylinder, a bore within said bulkhead slidably and sealably receiving said hollow piston rod to permit reciprocation of said rod within said bulkhead bore, a counterbore within said bulkhead defining a high pressure injection liquid gallery for permitting high pressure liquid to be fed



to the gallery, a bushing fixedly carried internally of said hollow piston rod at said bulkhead and rotatably mounting said indicator shaft, said shaft being of a diameter less than the internal diameter of the hollow piston rod, at least one radial hole extending through said hollow piston rod, a cylindrical tube concentrically surrounding said hollow piston rod and being fixed at one end to said bulkhead and being sealed at its opposite end to said hollow piston rod, terminating at that end in proximity to said slide valve bearing recess of said compressor housing and being open internally to said gallery such that irrespective of axial position of the slide valve, the high pressure injection liquid for feeds from the gallery through the interior of said hollow piston rod between said bushing and said slide valve, and fluid passage means through said hollow rod and said slide valve, and opening to an injection port on the face of the slide valve proximate to said rotor receiving bores of said compressor housing; whereby, liquid injection can take place within the compression process, sealed from the chamber to the side of the unload cylinder piston proximate to said slide valve.

4,536,131

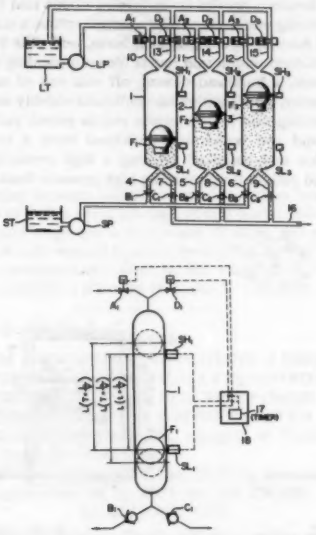
APPARATUS FOR CONTINUOUS PRESSURE FEEDING OF SLURRY

Makoto Saito, Higashiibaraki; Masakatsu Sakamoto, Matsudo; Kenji Uchida, Kashiwa, and Yukishige Kamino, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1984, Ser. No. 578,109
Claims priority, application Japan, Feb. 28, 1983, 58-30709
Int. Cl.³ F04F *11/00*; F04B *15/02*
U.S. Cl. 417—102 **2 Claims**

1. An apparatus for continuous pressure feeding of slurry, including a plurality of supply chambers which are arranged in parallel to each another, each of said supply chambers having

an upper portion and a lower portion, driving liquid supply and discharge pipes having valves and connected to the upper portion of each said supply chamber, slurry supply and discharge pipes having valves and connected to the lower portion of each said supply chamber, a float floating on the interface between the driving liquid and the slurry within each of said supply chambers, and sensor means provided around the upper portion and the lower portion of each of said supply chambers wherein the valves of said driving liquid supply and discharge pipes and said slurry supply and discharge pipes are selectively



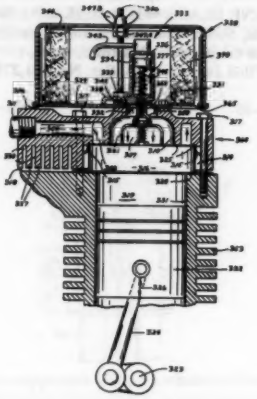
opened and closed for continuous pressure feeding of the slurry, said apparatus characterized in that means are provided for maintaining the continuous pressure feeding of slurry by said apparatus when said sensor means fails to detect the the position of the float, said means for maintaining including a timer for generating a signal instead of a signal of the sensor means, a period of time corresponding to a flow rate within the supply chamber is set in said timer, and when said period of time lapses, a command signal is generated by said timer and selectively applied to said valves.

4,536,132
GAS COMPRESSOR

William L. Tenney, Crystal Bay, Minn., assignor to London Fog, Inc., Long Lake, Minn.

Division of Ser. No. 238,011, Feb. 25, 1981, Pat. No. 4,391,568, which is a continuation of Ser. No. 917,185, Jun. 20, 1978, abandoned. This application May 25, 1983, Ser. No. 498,133
Int. Cl.³ F04B *41/04, 17/00*
U.S. Cl. 417—237 **24 Claims**

1. An apparatus for compressing gas and delivering partially cooled gas to a desired location, comprising: a crankcase assembly having crankshaft means, a single cylinder attached to the crankcase assembly, said cylinder having a cylindrical bore defining a chamber, a piston located in said bore connected to the crankshaft means operable to reciprocate the piston in the bore, blower means for moving air toward the cylinder, said blower means having a rotor connected to the crankshaft means and a shroud surrounding the rotor and extended toward the cylinder, said shroud having an air inlet opening, said crankcase assembly, cylinder, blower means, and piston comprising engine components of a conventional, air cooled, four-cycle, single cylinder internal combustion engine, a valve assembly mounted on the cylinder over the bore for controlling the flow of gas into and out of the chamber in response to movement of the piston in the bore, head means located in engagement with the valve assembly to hold the valve assembly on the cylinder over the chamber, said head means having a recess larger than the valve assembly accommodating the valve assembly and forming an annular space around the valve assembly, and spaced fins providing air passages leading to the

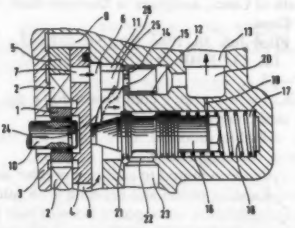


annular space whereby air from the blower means directly cools the valve assembly, said valve assembly having a gas inlet valve means allowing gas to flow into the chamber and gas outlet valve means allowing gas to flow out of the chamber, said head means and a gas outlet passage in communication with the outlet valve means, and means connected to the head means to carry gas from the head means to the desired location.

4,536,133
REGULATABLE VANE PUMP

Günther Seidl, Heubach, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen 1, Fed. Rep. of Germany

Filed Mar. 22, 1984, Ser. No. 592,475
Int. Cl.³ F04B *49/08;* G05D *11/00*
U.S. Cl. 417—307 **12 Claims**



1. In a displacement vane pump flow regulator device for a hydraulic power system wherein a pump has a housing with outlet pressure chamber (6) to communicate with a differential pressure actuated regulating piston (16); including flow restrictor means (12,24) having restrictor passage means (14, 15, 15') for pump pressure flow to a hydraulic power system; means (22, 23) whereby outlet chamber pressure actuation of said regulator piston permits pressure flow from said outlet pressure chamber to a pump suction return line and means (19, 20)

whereby pressure in said hydraulic power system effects piston actuation to shut-off said latter flow;

the improvement wherein said restrictor passage means comprises at least one restrictor bore normally open to communicate said pump pressure chamber to said hydraulic power system;

said flow restrictor means comprising closure means (24, 25) operated by said regulator piston to progressively at least partially shut off flow through said restrictor bore when said regulator piston is pressure actuated by pressure from said outlet pressure chamber, wherein said closure means comprises a closure member (25) disposed to move across the flow area of said restrictor bore with movement of said regulator piston in progressively restricting flow through said area; wherein said closure means and said restrictor bore coact to effect flexibility of closure engagement;

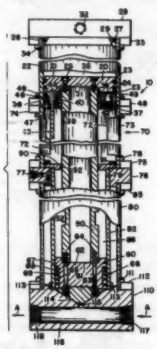
said bore having an open port in a plane intersecting the axis of said regulator piston and wherein said closure means comprises a member slidable across and flexibly biased against said port.

4,536,134

PISTON SEAL ACCESS APPARATUS

Otto A. Hulber, Kentwood, Mich., assignor to Hi-Tech Engineering, Inc., Grand Rapids, Mich.

Filed Apr. 30, 1984, Ser. No. 605,204
Int. Cl.³ F04B 9/10
U.S. Cl. 417—360 **8 Claims**



1. A liquid pump for a chemical injection molding system comprising:

a driving member movable with respect to a support housing;

a chemical injection cylinder including an injection piston;

rod means for coupling said piston and said driving member for synchronous movement, wherein said driving member is capable of moving said rod through a lineal distance sufficient to withdraw said injection piston from said injection cylinder when said piston is fixedly secured thereto;

means for securing said injection piston to said rod means to prevent rotation therebetween; and

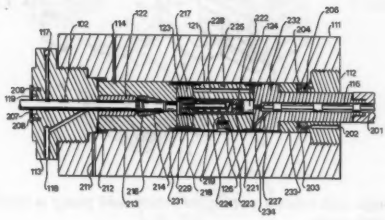
a cylindrical sleeve for coupling said housing and said injection cylinder in spaced relationship and including at least one access port such that said injection piston can be lineally withdrawn from said injection cylinder into said sleeve for servicing through said access port without disassembly of said pump.

4,536,135

HIGH PRESSURE LIQUID PISTON PUMP

John H. Olsen, Vashon, and Sigurd C. Mordre, Dockton, both of Wash., assignors to Flow Industries, Inc., Kent, Wash.

Filed Sep. 27, 1982, Ser. No. 424,206
Int. Cl.³ F04B 9/10
U.S. Cl. 417—383 **13 Claims**



1. A pump, comprising:

a housing;

inlet means for admitting fluid into said housing;

fluid pressurizing means within said housing in communication with said inlet means for pressurizing fluid received therefrom;

said fluid pressurizing means having wall means with internal and external wall surfaces, wherein said fluid pressurizing means includes a cylinder within said housing defined by said wall means, said cylinder being in fluid communication with said inlet means; a piston slidable within said cylinder for pressurizing fluid therein; and means for actuating said piston to provide an intake stroke for admitting fluid into said cylinder and a pressure stroke for pressurizing fluid within said cylinder; and wherein said means for controlling the pressure differential on said wall means includes reservoir means around the exterior surface thereof; and means for providing fluid communication between the interior of said cylinder and said reservoir, whereby high-pressure fluid within said reservoir means provides a compressive force on said wall means to control the pressure differential thereacross as said piston moves between said intake stroke and said pressure stroke;

means for conducting a high-pressure fluid output from said housing and said fluid pressurizing means; and,

means for controlling the fluid pressure differential acting on said wall surfaces, whereby stress on said wall means is controlled to prevent structural fatiguing thereof; and,

a separator in a housing between said piston and said inlet for isolating said pumped fluid from a second fluid wherein the area between said separator housing and said cylinder is vented to said inlet to urge said separator housing toward said cylinder.

4,536,136

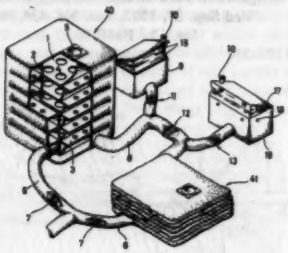
FILM-MADE PUMP DRIVEN BY THE FILLING EFFECT OF A FLUID ON FILLING INTO A CHAMBER MADE OF FILM

Yung-Huei Lan, 3 Fl. 32. Lane 61, Section 2, Hang Chou S. Rd., Taipei, Taiwan

Filed Mar. 22, 1983, Ser. No. 477,610
Int. Cl.³ F04B 9/08, 43/10, 45/00
U.S. Cl. 417—389 **5 Claims**

1. A pump composed of a flexible film consisting of a pumping chamber having a one-way valved intake port and a one-way valved exhaust port, a surrounding supporting chamber composed of a pipe network, said network having a combination intake/exhaust inlet, upon said supporting chamber being filled through said inlet with a first fluid, said pumping chamber expands, being supported by said support chamber, to absorb a second fluid through said intake port, and upon col-

lapsing said support chamber by forcibly removing the fluid therefrom said pumping chamber discharges the fluid therein



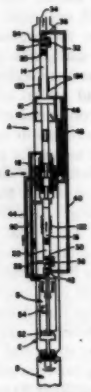
through said exhaust port, after which said pump is ready for the next cycle.

4,536,137

SUBMERGIBLE PUMPING APPARATUS

Russell J. Bookout, Bartlesville, Okla.; Bernard A. Pearson, Bothell, and John W. Jacobs, Seattle, both of Wash., assignors to TRW Inc., Cleveland, Ohio

Filed Sep. 30, 1982, Ser. No. 429,177
Int. Cl.³ F04B *47/08*
U.S. Cl. 417—390 **2 Claims**



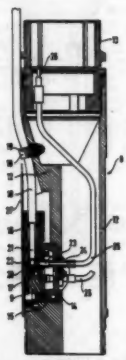
1. Submergible pumping apparatus for use in oil and other wells comprising, in a downhole unit, a piston-plunger assembly including a power piston adapted to reciprocate in a power cylinder, and a plunger connected to the piston for reciprocation in a plunger chamber, inlet valve means for admitting well fluid to the plunger chamber on suction strokes of the plunger within the chamber, discharge valve means for discharging well fluid from the plunger chamber into a discharge means on pumping strokes of the plunger within the chamber, a power fluid reservoir, pump means for delivering high pressure power fluid from the reservoir to the power cylinder for operating the power piston, and a control valve for effecting stroke reversal of the power piston by alternately providing connections for the high pressure power fluid to one or the other end of the power cylinder and for low pressure power fluid from said other or said one end of the power cylinder to the reservoir, and reversing said connections when the power piston approaches opposite ends of its stroke, respectively, the control valve comprising a spool valve including a reciprocating valve rod section formed as a part of said piston-plunger assembly, and including a reciprocating valve spool encircling the valve rod section and disposed in a stationary valve housing, the valve housing including passage means providing communication for power fluid between the reservoir, the control valve, and the power cylinder, and port means providing communication between the passage means and the exterior of the valve spool, the control valve further including a central vent hole in the valve spool connecting the exterior of the spool with an internal spool groove, further vent holes at opposite ends of the spool respectively connecting the interior of the spool with respective actuating annuli defined between opposite end portions of the spool exterior and the valve housing, and spaced annular grooves in the valve rod section for connecting the central vent hole to one of the actuating annuli while venting the other of the annuli to the reservoir when the piston-plunger assembly approaches one end of its stroke, so as to apply fluid pressure to the valve spool in a manner axially shifting the valve spool in one direction, thereby reversing said connections, the central vent hole likewise being connected to the other actuating annulus while said one actuating annulus is vented, when the piston-plunger assembly approaches the other end of its stroke, so as to apply fluid pressure to the valve spool axially shifting the spool in reverse direction.

4,536,138

MOTOR-DRIVEN PUMP ASSEMBLY WHICH CAN BE USED UNDER WATER

Jacques Romand-Monnier, Delle, and Jean-Pierre Lejeune, Beaucourt, both of France, assignors to Alsthom-Atlantique, Paris, France

Continuation of Ser. No. 480,611, Mar. 30, 1983, abandoned. This application Dec. 28, 1984, Ser. No. 687,232
Claims priority, application France, Apr. 5, 1982, 82 05852
Int. Cl.³ F04B *35/04*
U.S. Cl. 417—422 **2 Claims**



1. A submersible motor-driven pump assembly formed of axially aligned, end to end joined vertically oriented modular units for use under water, said modular units including at least one electric motor unit having an upper end and a lower end surmounted by at least one pump unit connected to the upper end of said motor unit so as to rotate the pump, the improvement wherein said end to end joined vertically oriented modular units include an electric connection module situated beneath said at least one electric motor unit coaxially aligned therewith and having an upper end detachably fixed to the lower end of the motor unit, for electrically energizing said at least one motor unit, and said electrical connection module having a connector pin connected to a cable, said cable running upwardly therefrom externally of said assembly and being fixed thereto, said connector pin being mounted within said electrical connection module, said electrical connection module further including at least one inside connector member fixed to the upper end of said electrical connection module for

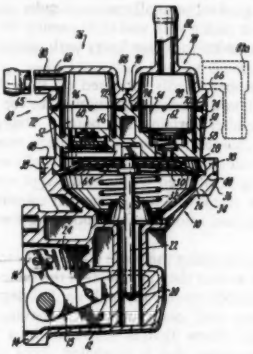
effecting electrical connection at said upper end of said electrical connection module with said at least one electric motor unit at its lower end, and internal conductor means extending from said connector pin to said at least one inside connector member for supplying power from said cable to said at least one motor unit for rotating said pump.

4,536,139

DIAPHRAGM PUMP

Claudio Greco, and Silvano Biandino, both of Turin, Italy, assignors to Societa' Impianti Elettrici Telefonici Telegrafici E Costruzioni Edili, Florence, Italy

Filed Jun. 7, 1983, Ser. No. 501,792
Claims priority, application Italy, Jun. 8, 1982, 22121/82[U]
Int. Cl.³ F04B 43/14
U.S. Cl. 417—471 7 Claims



1. A diaphragm pump, of the type comprising a lower body and an upper body with mating annular peripheral flanges between which the periphery of the diaphragm is gripped, and in which the lower body contains a mechanism for deforming said diaphragm in a reciprocating manner, and in which said upper body is formed with two housings which contain respectively an automatic intake valve and an automatic delivery valve through which a chamber overlying the diaphragm is put into communication with an intake pipe union and a delivery pipe union respectively, which branch from corresponding spaces overlying the respective valves, characterised in that:

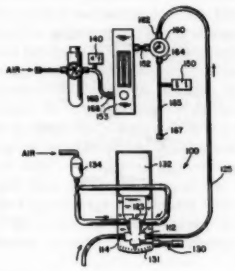
said upper body has a pair of separate cavities arranged side-by-side, each of which houses one of the valves and has an upper bell-shaped annular part of revolution; and associated with each cavity is a cap separate from said upper body and one another, each cap having a pipe union branching therefrom and having a skirt of revolution engaging the corresponding bell-shaped part, one forming an inlet and one forming an outlet; at least one of each bell-shaped part and the corresponding skirt being resilient; each skirt and the corresponding bell-shaped part having cooperating snap-engageable members and facing radial surfaces between which is clamped an annular sealing washer, at least one of said caps including said pipe union branching therefrom at an angle from the axis of said cap and said cap and pipe union rotatable to different tangential positions.

4,536,140

PUMP APPARATUS AND SYSTEM FOR CONTAINING AND METERING UNIFORM PULSES OF A SMALL AMOUNT OF A HAZARDOUS LIQUID

Roger T. Guthrie, Pasadena, Md., assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed Nov. 14, 1983, Ser. No. 551,447
Int. Cl.³ F04B 7/06
U.S. Cl. 417—500 9 Claims



1. A pump apparatus for completely containing and precisely metering uniform pulses of small quantities of a hazardous and reactive fluid comprising:

a unitary piston housing having interior cylindrical walls, said piston housing having an elongated bore extending from a first open end to a position proximate a second closed end, said elongated bore having a pumping chamber region at said second end,

a pumping fluid inlet means to said pumping chamber,

a pumping fluid outlet means from said pumping chamber,

a reciprocating and rotating piston, said piston being positioned in a uniform mating relationship with the interior walls of said piston housing with a close tolerance therebetween during said pumping cycle for reciprocating motion within said elongated bore of said piston housing, from a first position in which said piston substantially occupies the space within said pumping chamber and displaces pumped fluid from said pumping chamber to a second position in which said piston is substantially removed from said pumping chamber and draws pumping fluid into said chamber,

a barrier fluid inlet for providing communication between a source of barrier fluid and said elongated bore at a position which is between said elongated bore first and said pumping chamber and adjacent said piston,

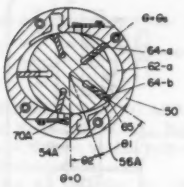
pressure means for delivering said barrier fluid directly to said elongated bore at a pressure which is greater than the maximum fluid pressure within said pumping chamber,

whereby moist air is prevented from leaking into said piston and when pumping fluid is drawn into said chamber, and migration of pumped fluid from said pumping chamber, along the piston, to said first open end is precluded by said barrier fluid.

4,536,141
ROTARY VANE COMPRESSOR WITH SUCTION PASSAGE CHANGING IN TWO STEPS

Teruo Maruyama, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP83/00067, § 371 Date Nov. 1, 1983, § 102(e) Date Nov. 1, 1983, PCT Pub. No. WO83/03123, PCT Pub. Date Sep. 15, 1983
PCT Filed Mar. 3, 1983, Ser. No. 554,293
Claims priority, application Japan, Mar. 4, 1982, 57-34823; Mar. 23, 1982, 57-46666
Int. Cl.³ F04C *18/00, 29/08*
U.S. Cl. 418—150 1 Claim



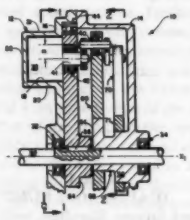
1. A rotary compressor comprising:
a cylinder having a non-circular inner peripheral surface;
side plates fixed to and closing the axial ends of said cylinder;
a rotor, rotatably mounted in said cylinder, having radially extending, equiangularly spaced slots therein; and
slidable vanes radially slidably mounted in said slots so as to slidably engage said inner surface when rotated with said rotor in a rotational direction in said cylinder, so as to define sealing spaces between the outer periphery of said rotor, said inner peripheral surface of said cylinder, and said side plates, and blade chambers in said sealing spaces respectively bounded on at least one circumferential side by said vanes so as to rotate and vary in volume as said rotor and vanes rotate in said cylinder, said blade chambers having a predetermined maximum value V_0 during said rotation;
said cylinder having suction bores and discharge bores, including a respective suction port and a respective discharge port opening into each of said sealing spaces through said cylinder adjacent respective opposite circumferential ends thereof, said respective discharge port being located downstream of said respective suction port with respect to the rotational direction of said rotor;
said vanes and said blade chambers rotating across said suction bores and discharge bores as they rotate with said rotor, such that each of said suction bores open into said blade chambers as said blade chambers rotate thereacross, and said suction bores communicate with any one of said blade chambers over a continuous total rotational angle of travel θ_s of said rotor divided into a first angle of travel θ_A and a second angle of travel θ_1, such that over said first angle of travel θ_A, said suction bore has a first effective suction area a_1 of communication with said blade chamber and, over said second angle of travel θ_1, said suction bore has a second effective suction area a_2 of communication with said blade chamber, wherein:

$a_1 > a_2$,
$\theta_1/\theta_s > 0.170$ and
$0.025 < K_{22} < 0.055$,
wherein K_{22} is defined as $a_2\,\theta_s/V_0$.

4,536,142
IMPELLING MECHANISM

Howell M. Sumrall, 4447 Marraco Dr., San Diego, Calif. 92115

Filed Nov. 9, 1983, Ser. No. 549,896
Int. Cl.³ F04C *2/00, 18/00*
U.S. Cl. 418—227 16 Claims

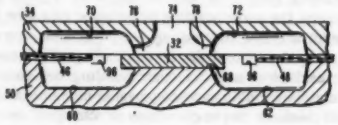


1. An impelling mechanism comprising:
a housing defined by an upper casing and a lower casing, at least one swept volume chamber formed in said upper casing, at least one fluid input port in communication with said swept volume chamber, at least one fluid output port in communication with said swept volume chamber;
a shaft oriented substantially perpendicular to the top wall of said upper casing with said shaft passing therethrough and being journaled to rotate freely with respect to said upper casing;
a rotor member fixedly mounted on said shaft and being located in said housing, a portion of the top surface of said rotor member forming the bottom wall of said swept volume chamber, a plurality of blade members each of which is mounted on its own crankshaft, said blade members being positioned within said swept volume chamber and their crankshaft being oriented substantially perpendicular to said rotor member and being journaled therein; and
means for controlling the blade attitude of each of said blade members so that they all maintain the same attitude as the rotor member travels through its 360 degree revolution comprising said crankshafts each having at least one crankshaft throw that is journaled in a blade attitude control member that is journaled about a disc member within which said shaft is journaled, said disc having a fixed relationship with said lower casing.

4,536,143
APPARATUS FOR CONTINUOUSLY MOLDING OF ARTICLES WITH PLURAL BAND-LIKE MEMBERS

George B. Moertel, Conneautville, Pa., assignor to Talon, Inc., Meadville, Pa.

Continuation of Ser. No. 285,906, Jul. 23, 1981, Pat. No. 4,350,656, which is a continuation-in-part of Ser. No. 154,650, May 30, 1980, abandoned. This application Sep. 17, 1982, Ser. No. 419,290
The portion of the term of this patent subsequent to Sep. 21, 1991, has been disclaimed.
Int. Cl.³ B29D *5/00*
U.S. Cl. 425—115 3 Claims



1. An apparatus for producing a row of coupling members for a slide-fastener stringer comprising:

a forming wheel provided on the periphery with a multiplicity of equispaced outwardly open forming beds having configurations complementary to contours of respective coupling members to be formed therein, and a circumferential outwardly open groove intersecting said beds;

an endless forming band extending around a portion of the periphery of said wheel and provided with openings respectively registering with said beds whereby said each opening and the bed in registry therewith forms a respective mold cavity;

an undercutting band received wholly in said groove and interposed between said periphery of said wheel and said forming band and projecting into said mold cavity, said forming band being of a width sufficient to span over said beds and said undercutting band on the periphery of said wheel; and

means for introducing thermoplastic synthetic resin into each of said mold cavities to produce respective coupling members of complementary shape therein whereby, upon separation of said members from said wheel and said bands, said undercutting band forms an undercut portion in each coupling member.

4,536,144

REVERSING MECHANISM FOR SAFETY GATE OF INJECTION MOLDING MACHINE

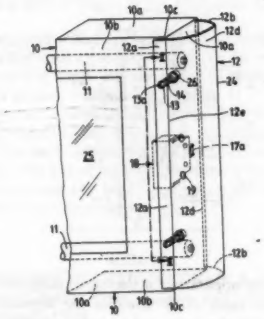
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Sep. 19, 1983, Ser. No. 533,456

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234453

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—154 **9 Claims**



1. A safety gate control mechanism for a production machine having a safety gate which is movable between open and closed positions by means of a safety gate drive with a drive control circuit, which control mechanism interrupts a closing movement of the safety gate, when the safety gate encounters an object or obstacle in its closing path, said safety gate control mechanism comprising in combination:

a straight leading edge on the safety gate extending transversely to the path of the closing movement of the safety gate;

a pivotable straight contact bar extending parallel to and ahead of said leading edge of the safety gate, the contact bar being attached to the safety gate by means of a pivot connection defining a contact bar pivot axis which is likewise parallel to the leading edge of the safety gate;

means for biasing the pivotable contact bar forwardly away from the leading edge of the safety gate into a rest position from which an obstacle in the path of the closing safety gate causes the contact bar to pivot rearwardly towards said leading edge, in opposition to said contact bar biasing means; and

switching means in the drive control circuit of the safety gate drive for interrupting the closing movement of the safety gate, in response to a rearward pivoting movement of the contact bar; and wherein:

the pivotable contact bar includes a wall portion with a curved surface corresponding substantially to a sector of a cylinder around the contact bar pivot axis, said curved surface having a rearwardly pointing extremity defining a trigger edge;

the switching means includes an electrical switch with a depressible switch plunger, the switch being mounted on the safety gate, behind its leading edge, and so oriented that the axis of the switch plunger is perpendicular to the contact bar pivot axis; and

the switching means further includes an actuating lever which is pivotably supported by the safety gate on a pivot axis which is parallel to the contact bar pivot axis and located between the contact bar pivot axis and the trigger edge of the contact bar in rest position, the actuating lever being movable between a rest position and a pivoted position and having a first extremity cooperating with the switch plunger to depress the latter, when the actuating lever is pivoted out of its rest position, and a second extremity which, in the rest positions of the actuating lever and of the contact bar, extends into the the path of said trigger edge of the contact bar in the immediate vicinity of said trigger edge, overlapping its pivoting path by such a radial depth that, when the contact bar is pivoted rearwardly, its trigger edge cooperates with the second extremity of the actuating lever to pivot the actuating lever and to thereby depress the switch plunger.

4,536,145

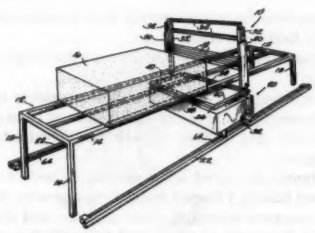
APPARATUS FOR FORMING AN EXPANDED FOAM FORM LINER INCLUDING A CONTOURED SURFACE

Robert D. Sawyer, Caledonia, and Michael W. Fohl, Brookfield, both of Wis., assignors to Tom Sawyer Supply & Equipment, Caledonia, Wis.

Filed May 7, 1984, Ser. No. 607,516

Int. Cl.³ B29C *17/00*

U.S. Cl. 425—289 **20 Claims**



1. Apparatus for use in forming a decorative surface configuration in a block of expanded polystyrene foam, the apparatus comprising:

support means for supporting a block of expanded polystyrene foam,

a wire having opposite ends and being adapted to be connected to a voltage source whereby electrical current flowing throught the wire will heat the wire to a temperature higher than the melting temperature of the polystyrene foam,

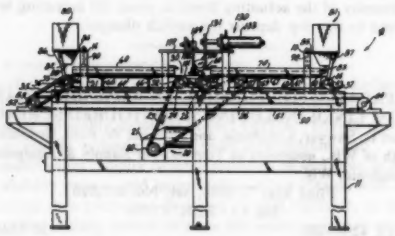
means for supporting the wire in generally linear relation, said means for supporting the wire including means for causing movement of the wire through the expanded foam block to cut a decorative surface configuration in the block, the means for causing movement including a carriage supported for linear reciprocal movement along the length of the block of expanded polystyrene foam between a retracted position and an extended position, means for causing movement of the carriage along the

length of the block, and means for causing movement of the wire including means for causing lateral reciprocal movement of the wire in the direction of the longitudinal axis of the wire as the wire moves from the retracted position to the extended position, and means for causing vertical reciprocal movement of the wire as the wire moves from the extended position to the retracted position, the means for causing reciprocal movement of wire in the direction of the longitudinal direction and the means for causing vertical reciprocal movement of the wire being connected to the means for causing movement of the carriage along the length of the block such that the vertical position of the wire and the lateral position of the wire are dependent on the position of the carriage with respect to the block.

4,536,146
CROQUETTE MACHINE

Luis A. Hernandez, 8160 W. 16th Ave., Hialeah, Fla. 33014, and Jorge E. Gonzalez, 4724 SW. 7 St., Apt. #1, Miami, Fla. 33134

Filed Nov. 16, 1984, Ser. No. 671,928
Int. Cl.³ A21C 3/00
U.S. Cl. 425—297 **14 Claims**



1. A machine for manufacturing food products made from a source of food mass comprising:

(a) a nozzle assembly for continuously discharging said food mass;

(b) a recriprocating chopper in close proximity to said nozzle assembly for severing said food mass from said nozzle whereby said severed mass is positioned adjacent said chopper;

(c) a tunnel in spaced apart relation to said chopper, said tunnel having a shaped internal passageway; and

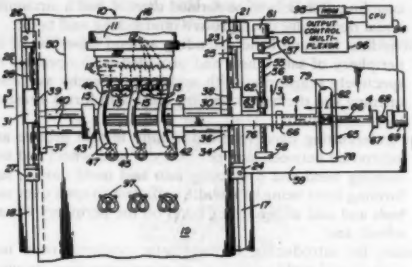
(d) a conveyor extending from adjacent said chopper and along the length of said tunnel for receiving said severed mass and urging said severed mass along said passageway whereby said severed mass is shaped by said passageway during its movement along said tunnel.

4,536,147
FOOD PROCESSING APPARATUS

Edwin T. Groff, 120 S. Third Ave., West Reading, Pa. 19611

Filed Jun. 29, 1984, Ser. No. 626,239
Int. Cl.³ A21C 3/06
U.S. Cl. 425—323 **13 Claims**

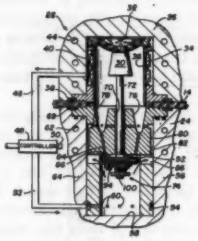
1. A food processing apparatus comprising an extruder having an outlet, a nozzle connected to said outlet for discharging extrudate, an extrudate receiver located to receive extrudate from said nozzle, mounting means mounting said nozzle and receiver for universal relative motion in two axes to discharge extrudate in any preselected configuration on said receiver positioning means in driving relation with said mounting means for selectively effecting said universal relative motion. programmable controller means for selectively and variably controlling said positioning means to effect continuous or discontinuous relative motion of said mounting means.



4,536,148
APPARATUS FOR MAKING A THIN WALLED CONTAINER FROM A PLASTIC RESIN

Jackie D. Murley, Big Spring, and Marion Johnson, Baytown, both of Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Jun. 26, 1984, Ser. No. 624,560
Int. Cl.³ B29C 17/04
U.S. Cl. 425—387.1 **5 Claims**



1. In improved apparatus for thermoforming an article from a thermoplastic resin sheet wherein the apparatus includes means for heating the sheet and a source of pressure gas, the improvement comprising:

first and second mold platens each having at least one mold recess therein and moveable relatively together and apart, at least one mold recess in each said platen in alignment with the mold recess in the other said mold platen;

gas control means for connecting said recesses to the source of pressure gas and for venting said recesses;

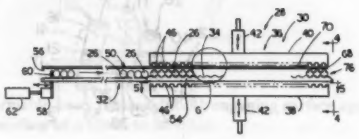
an article mold located in the mold recess in said second mold platen, said mold including a wall defining the configuration of said article and having a plurality of gas ports extending therethrough whereby the exterior of said article can be, at times, exposed to said pressure gas and at other times vented;

a preform mold located in the mold recess in said first mold platen, said mold including a wall forming an annular cavity therein, a plurality of gas ports extending through said wall, and pressure-actuated piston means located in said preform mold and moveable between upper and lower limits by said gas into the cavity in said article mold to aid in displacing said resin sheet into said article mold to form said article.

4,536,149
APPARATUS FOR MAKING GROOVES IN CIGARETTE FILTERS

Erik I. Naalund, Los Gatos, and Steven P. Reed, Felton, both of Calif., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 18, 1984, Ser. No. 632,166
Int. Cl.[3] B29D *17/00*
U.S. Cl. 425—394 18 Claims



1. An apparatus for making grooves in filter rods comprising:

die means comprising a lower die block and an upper die block, both die blocks being adapted for movement toward and away from each other, the lower die block having elongated groove forming projections projecting generally toward the upper die block and the upper die block having elongated groove forming projections projecting generally toward the lower die block, whereby the groove forming projections of the lower die block and upper die block are adapted to be embedded into a filter rod disposed between the lower and upper die block to impress grooves in the filter rod when the lower and upper die blocks are moved toward each other;

means disposed between the lower and upper die blocks defining a path of travel of the filter rods through the die means;

means associated with the path defining means for positioning the filter rods to be grooved in the die means between the lower and upper die blocks in longitudinal alignment with the groove forming projections;

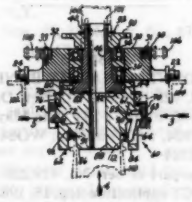
stripper means for holding the grooved filter rods in the path defining means as the lower and upper die blocks move away from each other to allow the groove forming projections to be extracted from the filter rod; and,

means for moving the lower and upper die blocks toward and away from each other.

4,536,150
CARRIER WITH EXCHANGEABLE CHUCK

Roger D. Smith, Bethel, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 355,224, Mar. 5, 1982, Pat. No. 4,456,447. This application Nov. 14, 1983, Ser. No. 551,041
Int. Cl.[3] B29D *23/03*
U.S. Cl. 425—526 10 Claims



1. An article gripping chuck for use in a blow molding machine conveyor including article carriers, the blow molding machine producing finished articles from article preforms having a formed portion and a formable portion injecting an expansion fluid into the preform, the article gripping chuck comprising:

(a) a chuck body having a surface for mounting to a carrier and a passage therethrough for admission of the expansion fluid;

(b) a plurality of article gripping levers rotatably supported upon the chuck body for selectively engaging the formed portion of an article preform to hold the open end thereof in communication with the passage, each lever having a formed portion engaging projection at one end thereof, and at the opposite end of such lever a first ball end on one side for rotatably engaging said chuck body and a second ball end disposed to rotatably engage the below described annular actuating means;

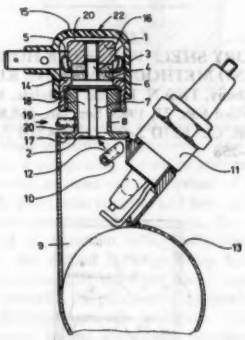
(c) annular actuating means slidably disposed upon the exterior of the chuck body for rotatably engaging said opposite ends of said levers for imparting radial swinging of said one ends responsive to sliding motion on said chuck body;

(d) biasing means for retaining urging said annular acting means in a formed portion preform engaging position.

4,536,151
MIXTURE PREPARATION FOR ENGINE-INDEPENDENT HEATERS

Herbert Langen, Altbach; Peter Reiser, and Erich Kenner, both of Esslingen, all of Fed. Rep. of Germany, assignors to J. Eberspächer, Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 550,135
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244405
Int. Cl.[3] F23C *11/04*
U.S. Cl. 431—1 2 Claims



1. A space heater, particularly for automobiles, comprising a housing defining a combustion chamber, an antechamber housing defining an antechamber extending tangentially into said housing combustion chamber, ignition means in said antechamber for igniting a fuel and air explosive mixture, an ultrasonic vibrator housing connected into said antechamber, an ultrasonic vibrator in said ultrasonic vibrator housing including a vibratory plate, means for directing combustion air into said ultrasonic housing adjacent said vibratory plate, and means in said antechamber for directing a fuel toward said vibratory plate for admixture with the air moved by said plate to form a fuel and air mixture which is directed into said antechamber.

4,536,152

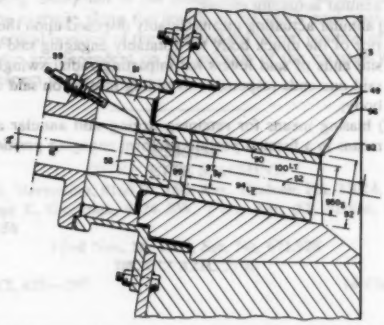
HIGH-VELOCITY GAS BURNERS

Victor Little, Jr., Edison, and Charles L. Thomas, South Plainfield, both of N.J., assignors to ASARCO Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 482,080, Apr. 4, 1983, abandoned. This application Apr. 10, 1984, Ser. No. 598,397

Int. Cl.³ F23D *13/00*

U.S. Cl. 431—159 10 Claims



1. An improved gas burner providing about a 2½:1 turndown capacity while maintaining a stable flame with even and complete combustion over this range comprising a mixing section for uniting a stream of fuel and a stream of oxygen containing gas, a flame holder section having an exit diameter, D_F, for igniting the mixture of fuel and oxygen and an adjacent combustion chamber to retain the combustion and to enhance combustion, the combustion chamber being formed by a refractory burner tile and being of substantially cylindrical shape and having a diameter, D_S, an effective length, L_E, and an overall burner tile length, L_T, the improvement comprising:

correlating the burner dimensions whereby

D_S/D_F is between about 1.35 to 1.70 and

L_E/D_S is between about 1.2 to 3.7.

4,536,153

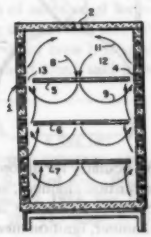
REFRACTORY SHELF FOR HOME HOBBYIST KILN AND METHOD OF MAKING KILN

Frank H. Anthony, 1709 N. Hullen, Metairie, La. 70001

Filed Feb. 23, 1983, Ser. No. 468,876

Int. Cl.³ F27D *5/00, 1/16;* A21B *1/00*

U.S. Cl. 432—258 12 Claims



1. A refractory shelf for use in a home hobbyist kiln which has a refractory lined closed cavity, said shelf comprising a shaped, dried, and fired refractory support having a single hole located substantially at its geometric center, said shelf having outer dimensions less than the interior dimensions of said cavity so as to permit updrafts of heated air currents to pass between said shelf and the wall of said cavity.

4,536,154

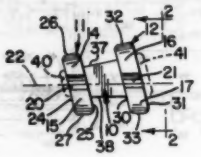
EDGEWISE BRACKET

Robert E. Garton, Jr., Elkhart Lake, and John E. Vigiletti, Sheboygan, both of Wis., assignors to American Orthodontics Corporation, Sheboygan, Wis.

Filed Jun. 11, 1984, Ser. No. 619,336

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—8 8 Claims



1. An orthodontic bracket for use with an archwire to impart corrective forces to a tooth comprising,

a base portion for attachment to the tooth,

a mesial tie wing integral with an extending from the base portion, said mesial tie wing having a gingival tip and an occlusal tip and a buccolabial opening archwire slot between the tips,

a distal tie wing integral with and extending from the base portion and in parallel spaced relation to said mesial tie wing, said distal tie wing having a gingival tip and an occlusal tip and a buccolabial opening archwire slot between the tips and aligned with the slot in said mesial tie wing,

each of said tie wings having parallel mesial and distal sides, said archwire slots defining a reference line for orientation parallel to the occlusal plane of a patient,

the tie wings being oriented such that said sides are obliquely angled to said reference line, whereby said tie wings can be generally vertically disposed parallel to the tooth long axis and still be inclined at an oblique angle to said reference line,

said gingival tips of said tie wings have top surfaces angularly disposed to said reference line and perpendicular to the vertical axis of the bracket and the mesial and distal sides of the wings and said occlusal tips having bottom surfaces parallel to said reference line,

whereby the outer borders of said tie wings for a trapezoidal configuration and the axis of said archwire slots is disposed relative to said tie wings so that said gingival tips and said mesial tips of said tie wings are of unequal size and the top surface of the gingival tie wings facilitate the mounting of the bracket such that the top surfaces may be disposed to extend substantially perpendicular to the long axis of a tooth.

4,536,155

DENTAL MATRIX BAND

Edward J. Ireland, 925 Burdette St., New Orleans, La. 70118

PCT No. PCT/US83/01401, § 371 Date May 17, 1984, § 102(e) Date May 17, 1984, PCT Pub. No. WO84/01100, PCT Pub. Date Mar. 29, 1984

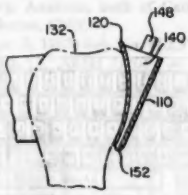
Continuation-in-part of Ser. No. 419,220, Sep. 17, 1982, abandoned. This PCT application Sep. 15, 1983, Ser. No. 611,011

Int. Cl.³ A61C *5/04*

U.S. Cl. 433—39 14 Claims

1. In a dental matrix band having a central tooth circumscribing portion with a tooth engaging surface extending between cervical and occlusal edges, the central portion merging with a pair of arms adapted for engagement by a retainer appliance, the improvement comprising:

a leaf-like flap secured to said central portion and adapted to overlie the tooth engaging surface thereof, said flap being



deformable away from said tooth engaging surface against the surface of a tooth to be filled.

4,536,156

INSTRUMENT FOR THE TREATMENT OF DENTAL CANALS

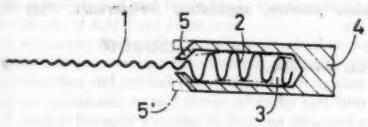
Francois Cattin, La Chaux-de-Fonds, Switzerland, assignor to Fluckiger & Huguenin S.A., La Chaux de Fonds, Switzerland

Filed Aug. 8, 1980, Ser. No. 176,333

Claims priority, application Switzerland, Sep. 26, 1979, 8659/79

Int. Cl.³ A61C *5/02*

U.S. Cl. 433—102 **11 Claims**



1. An instrument for the treatment of dental canals comprising: a mandrel having a substantially cylindrical bore extending axially of said mandrel; and a pulp burr comprising a helical wire having a helical extension fitted in the substantially cylindrical bore under stress, the cylindrical bore and the helical extension fitted in the cylindrical bore under stress together comprising drive transmitting means having a torque-limiting function for transmitting rotation of the mandrel by friction to the pulp-burr wherein said extension is of substantially cylindrical helical form which prior to being fitted under stress in the cylindrical bore is bent at an angle to the axis of the helical pulp-burr.

4,536,157

LEVER ACTUATED CHUCK MECHANISM FOR DENTAL HANDPIECE

Leonid I. Maizenberg, Chicago, Ill., assignor to Sybron Corporation, Rochester, N.Y.

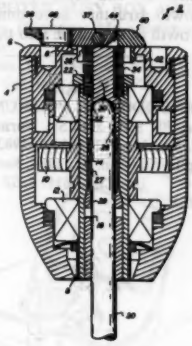
Filed Nov. 21, 1984, Ser. No. 673,863

Int. Cl.³ A61C *1/14*

U.S. Cl. 433—129 **8 Claims**

1. A chucking mechanism for inclusion in the head of a dental handpiece, said chucking mechanism including a bur tube disposed for rotation within said head, said bur tube having a tapered inner surface along a portion of its length, a drawback chuck disposed within said bur tube for rotation therewith and having a tapered outer surface along a portion of its length to coact with the tapered inner surface of said bur tube, said chuck including a radially extending retaining ring at its top end and a spring operatively disposed between said bur tube and said retaining ring urging said chuck to a clamping position, wherein the improvement comprises:

a cam lever pivotally mounted relative to said head in operative relationship with the top end of said chuck, said cam lever being reciprocable to an open position to move said chuck to its open position against said spring and to a



closed position to return said chuck to its clamping position under the influence of said spring.

4,536,158

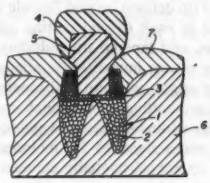
ORAL PROSTHESIS AND METHOD FOR PRODUCING SAME

Paul F. Bruins, Brooklyn, and Arthur Ashman, New York, both of N.Y., assignors to Medical Biological Sciences, Inc., New York, N.Y.

Division of Ser. No. 214,572, Dec. 8, 1980,. This application Sep. 30, 1982, Ser. No. 428,750

Int. Cl.³ A61K *6/08*

U.S. Cl. 433—201.1 **25 Claims**



1. An implantable prosthesis for hard tissue including a porous hard-tissue-ingrowth structure, the hard-tissue-ingrowth structure comprising a mass of polymeric particles, each particle having an inner core comprised of a first biologically-compatible polymeric material and having an outer coating generally surrounding the inner core, the outer coating being comprised of a second biologically-compatible polymeric material, the second material being hydrophilic and having a composition different from the composition of the first polymeric material, the particles being bonded together to form the hard-tissue-ingrowth structure, the hard-tissue-ingrowth structure having interstices between the bonded particles forming pores into which hard tissue can grow, the size of the particles of the hard-tissue-ingrowth structure being such that the pores of the structure have dimensions effective to promote the growth of hard tissue into the pores.

2. The prosthesis according to claim 1 further including a soft-tissue-ingrowth structure comprising a mass of polymeric particles, each particle having an inner core comprised of the first biologically-compatible polymeric material and having an outer coating generally surrounding the inner core, the outer coating being comprised of the second hydrophilic biologically-compatible material, the particles being bonded together to form the soft-tissue-ingrowth structure, the soft-tissue-ingrowth structure having interstices between the bonded

particles forming pores into which soft tissue can grow, the size of the particles of the soft-tissue-ingrowth structure being generally shorter than the size of the particles of the hard-tissue-ingrowth structure and being such that the pores of the soft-tissue-ingrowth structure have dimensions effective to promote the growth of soft tissue into the pores.

4,536,159

ENDODONTIC INSTRUMENT

James B. Roane, 707 S.W. 24th St., Norman, Okla. 73069

Division of Ser. No. 464,972, Feb. 8, 1983, Pat. No. 4,443,193.
This application Jan. 24, 1984, Ser. No. 573,505
Int. Cl.³ A61C *5/02*
U.S. Cl. 433—224 **4 Claims**

1. A method of cleaning a root canal of a tooth, said method comprising the steps of:

(a) inserting in said root canal an endodontic instrument of the type including:

a working portion defined on a flexible shaft, said working portion including a plurality of spiral rotationally bi-directional cutting edges thereon; and

a tapered tip defined on said flexible shaft and intersecting an end of each of said cutting edges of said working portion, said tapered tip including a reduced diameter cutting means immediately adjacent said ends of said cutting edges, wherein said tapered tip is shaped such that sharp cutting points which are normally present at an intersection between said ends of each of said cutting edges and a standard 75° included angle conically tapered tip are substantially eliminated;

(b) operating said instrument to clean said root canal;

(c) automatically cutting a step back in said root canal by means of said reduced diameter cutting means as said instrument is operated.

4,536,160

COMPUTER KEYBOARD EDUCATIONAL TOY

John F. Hatfield, 4314 Shamrock Way, Castro Valley, Calif. 94546

Filed Sep. 21, 1984, Ser. No. 653,066
Int. Cl.³ G09B *13/00*; A63F *9/08*
U.S. Cl. 434—227 **4 Claims**

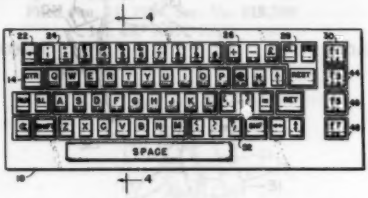
1. An educational toy comprising:

a base unit having substantially coplanar top and bottom surfaces;

a plurality of first slots in the top surface of said base unit, said slots extending partially through the thickness of said base unit and arranged in a plurality of substantially parallel rows across said top surface;

at least one second slot formed in a portion of the bottom of each of said plurality of first slots, each of said second slots extending through the lower surface of said base unit, the configuration of the combined first and second slots being unique to each first slot in the plurality; and

a plurality of keyboard bars each having a top and a bottom surface, each bar in said plurality having an exterior dimension adapted to fit within at least one of said first slots,



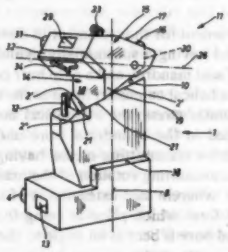
each bar having a bottom surface extension that fits into a second slot in said base unit.

4,536,161

ARTICULATOR

Urs Marty, Stötzlistrasse 62, 8707 Uetikon am See, Schweiz, Switzerland

Filed Apr. 12, 1984, Ser. No. 599,410
Claims priority, application Switzerland, May 6, 1983, 2495/83
Int. Cl.³ A61C *11/00*
U.S. Cl. 434—264 **9 Claims**



1. An improved articulator having a base including a support for a model of a lower jaw, said support carried by said base, having a support for a model of an upper jaw, which support is mounted to pivot around a lateral shaft extending within a fixture which is universally movable relative to said base, having further a pressing means including a spring and acting along an axis extending perpendicularly to said lateral shaft and operative to press said base and said fixture at their respective supporting surfaces together such that due to a form closed abutment of base and fixture of said supporting surfaces a defined relative position between base and fixture is reached, which said pivotable support for a model of an upper jaw is movably guided relative to said base by means of a cam and a cam follower, which said support for a model of an upper jaw is carried in a pivoting arm supported by means of said lateral shaft in a bearing pedestal, said bearing pedestal and said pivoting arm forming together said fixture;

in which said pivoting arm is guided movably relative to said bearing pedestal and laterally to said lateral shaft against the force of a second spring, and in which said cam and said cam follower are located between said pivoting arm and said base.

4,536,162

CHILD'S PLAYSET

Marshall E. Ace, Jr., deceased, late of Los Angeles, Calif. (by David L. Ramsey, executor); Ray W. Mattson, Venice, and Mark S. Wittenberg, Anaheim, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 5, 1983, Ser. No. 482,374
Int. Cl.³ A63H *33/08*
U.S. Cl. 446—102 8 Claims

1. A child's playset comprising:

a square base member including a generally horizontally extending floor having a front edge, a rear edge, a first side edge, and a second side edge, said base member also including an encompassing sidewall depending from said edges;

a first wall removably secured to said second side edge of said floor, said first wall including a handle member extending upwardly, away from said floor, whereby said playset may be picked up and transported;

a second wall removably secured to said floor along a line extending diagonally at least partially across said floor from one corner of said rear edge to the diagonally opposite corner of said front edge; and

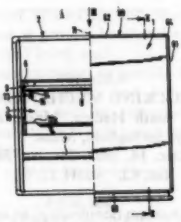
means affixed to diagonally opposite corners of said square base member to enable at least four playsets to be rotatably held together and rotated with respect to each other about axes perpendicular to said floors whereby said four playsets may be brought together to form an enlarged square.

4,536,163

MECHANISM FOR VERTICALLY MOVABLY SUPPORTING A BOARD MEMBER ON A WALL

Leo Schnirch, and Karl-Hermann Weyel, both of Haiger, Fed. Rep. of Germany, assignors to Weyel KG Visuelle Einrichtungen, Haiger, Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,541
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1982, 3239502
Int. Cl.³ B43L *1/04*
U.S. Cl. 434—420 20 Claims



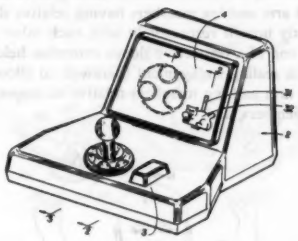
1. In a wall board, including a stationary board support which can be secured on a wall and a board member which can be moved vertically relative to said board support, said board member having thereon a surface, the improvement comprising vertical side walls connected to said board member, projecting rearwardly from a back side of said board member, and extending adjacent side edges of said board member, wherein on inner sides of said side walls there are guide rails which receive guide-slide pieces provided on said board support, and wherein said side walls cover said board support laterally and extend approximately to the wall.

4,536,164

TOY COMPUTER BUSY BOX ASSEMBLY

Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.

Filed Jun. 15, 1984, Ser. No. 621,197
Int. Cl.³ A63H *33/30*
U.S. Cl. 446—143 5 Claims



1. A toy assembly simulating a computer comprising: a console housing including a keyboard section and a screen section; manual actuating means mounted on said keyboard section for manual manipulation by a child; image means moveably mounted on said screen for viewing; and mechanical linkage means disposed within said console housing connected at one end to said manual activating means on said keyboard section and at the other end to said image means moveably mounted on said screen section whereby movement of said actuating mean produces a visibly moveable image on said screen, said mechanical linkage means including a first lever arm pivotally mounted in said housing intermediate its extremities and engaged at one end of said manual actuating means on said keyboard; a second lever arm connected at one end to the other end of said first lever arm through a slot-and-pin coupling arrangement; a cradle member connected at the other end of said second lever arm; and a visual image mounted on said screen section and connected to said cradle member by an arm member passing through a lineal extending slot in said screen whereby said image on said screen section moves in a lineal direction upon movement of said actuating means.

4,536,165

BATHEABLE DOLL

Lienhard Maar, Rödental, Fed. Rep. of Germany, assignor to Firma Max Zapf, Rödental, Fed. Rep. of Germany

Continuation of Ser. No. 459,591, Jan. 20, 1983, abandoned. This application Nov. 19, 1984, Ser. No. 672,866
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1982, 3203360; Nov. 13, 1982, 3242178
Int. Cl.³ A63H *23/00, 3/46*
U.S. Cl. 446—153 5 Claims

1. An immersible doll having a torso, and arms and legs joined to the torso comprising:

a water impermeable skin on said torso;

a hollow sleeve extension of flexible water impermeable material integral with said water impermeable skin at each shoulder and hip portion of said torso, each sleeve extension being closed at its outer end remote from said torso so that said sleeve extensions are watertight;

arm and leg members having hollow inner ends attachable to the outer ends of said extensions at the shoulder and hip portions, respectively;

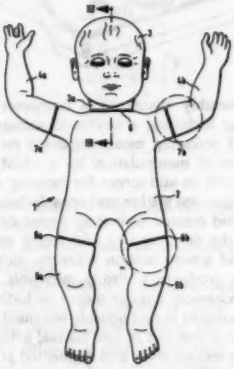
an inwardly directed flange on said hollow inner end of each arm and leg;

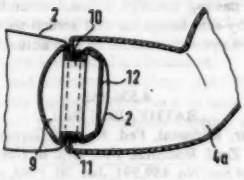
a laterally projecting flange extending from the inner edge of and at substantially 90° with respect to each inwardly

directed flange in the direction of the respective arm and leg;

a hollow coupling member having a peripheral portion with a substantially circular cross-section within the outer closed end of each sleeve extension for connecting respective arm and leg members thereto;

an inwardly directed annular groove in the peripheral portion of each coupling member formed by inwardly directed spaced flanges and a laterally directed circular cross-section cylindrical section connected to the inner edges of said spaced flanges and extending at substantially 90° with respect thereto, said annular groove and flanges on said arm and leg members having relative dimensions to tightly interfit respectively with each other with said closed end of a respective sleeve extension held therebetween in sealing engagement therewith to allow rotation of said arm and leg members relative to respective coupling members; and





a conically tapering section at the end of each coupling member insertable into said arms and legs, the larger diameter of which is adjacent said annular groove and larger in diameter than that of the respective laterally projecting flange, and the smaller diameter of which is less than the diameter of said respective laterally projecting flange, the largest diameter of the coupling member being at the outer edge of the inwardly directed flange adjacent the other end of said coupling member and being greater in diameter than the larger diameter of said conical section;

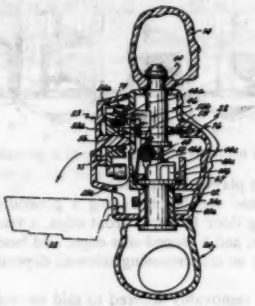
so that said conical sections and interfitting annular grooves and flanges facilitate insertion of a part of each coupling member into the inner end of respective arm and leg members with the outer end of the respective sleeve extension therebetween and retention of said arm and leg members on said sleeve extensions.

4,536,166

CAP FIRING ANIMATED FIGURE TOY

Larry H. Renger, Hawaiian Gardens, and Mike T. McKittrick, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 3, 1985, Ser. No. 688,931
Int. Cl.³ A63H *3/28*
U.S. Cl. 446—298 **17 Claims**



1. In a cap-firing figure toy, the combination comprising:

an upper torso having at least one arm member pivotally coupled thereto;

a hammer member movably mounted in said upper torso;

means connected to said upper torso for positioning at least one cap for impact by said hammer member;

means in said upper torso biasing said hammer member in a direction toward said at least one cap;

a lower torso rotatably connected to said upper torso;

means operatively interconnecting said hammer member and said lower torso in a manner such that relative pivoting of said upper and lower torsos in a first direction moves said hammer member against the force of its bias and relative pivoting of said torsos in an opposite direction actuates said hammer under force of its bias into contact with said at least one cap, said interoperative interconnecting means including means for delaying actuation of said hammer member until the relative pvioting of said torsos in the opposite direction is substantially complete whereby with said at least one arm extended the firing of a cap at the end of pivoting simulates the sound of a punch.

4,536,167

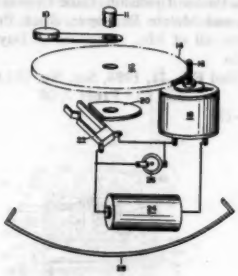
ROCKING MECHANISM

David C. Hughes, South Hadley, Mass., assignor to Milton Bradley Company, Springfield, Mass.

Filed Dec. 14, 1983, Ser. No. 560,893
Int. Cl.³ A63H *11/02*
U.S. Cl. 446—396 **6 Claims**

1. A rocking mechanism comprising: an unbalancing weight mounted on a driven wheel driven by a motor, control means for effecting intermittent rotation of the wheel by the motor, all mounted in a frame which allows it to rock three-dimensionally, the relation of the control means to the weight and motor being such that when the whole system is in balance the motor is energized by said control means to rotate the wheel together with its weight to unbalance the system causing it to rock from the horizontal, with the motor continuing to drive the wheel until the weight has returned to its balanced position at which time, due to the inertia of the total system, the rocking

motion will continue for some time depending on friction, distribution of weight and restoring force.



4. A rocking mechanism according to claim 1, wherein the frame is a toy submarine and including a periscope loosely coupled to the wheel and revolvable as the wheel is rotated.

4,536,168

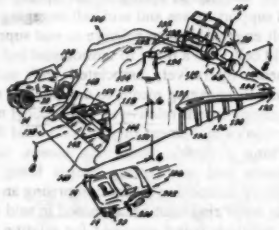
TOY VEHICLE PLAYSET

William F. Stephens, Hicksville, N.Y., assignor to Mattel, Inc., Hawthorne, Calif.

Continuation-in-part of Ser. No. 384,869, Jun. 4, 1982, abandoned. This application Apr. 2, 1984, Ser. No. 595,783

Int. Cl.³ A63H *17/40*

U.S. Cl. 446—444 **7 Claims**



2. In combination with a vehicle stunt apparatus and a toy vehicle having a pair of front wheels, a pair of rear wheels and a motor for powering said vehicle, the improvement which comprises:

a first ramp member affixed to said stunt apparatus and having a first end at ground level and a second end elevated above ground level; and

a first protuberance extending outwardly from one of said front wheels for riding up said first ramp member, whereby said vehicle will be forced over into a side wheelie so that said vehicle will travel on one front wheel and one rear wheel.

4,536,169

QUICK RELEASE SPRING POWERED TOY VEHICLE

Ferenc Fekete, Huntington Beach, and James E. Spears, Hawthorne, both of Calif., assignors to Mattel, Inc., Racine, Wis.

Filed Oct. 24, 1983, Ser. No. 545,022

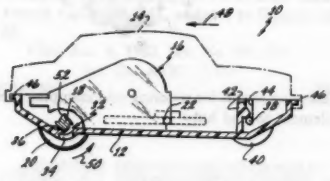
Int. Cl.³ A63H *29/24*

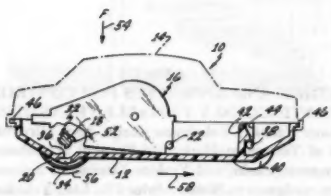
U.S. Cl. 446—461 **3 Claims**

1. A toy vehicle comprising a housing having a separate base and an upper body portion, the base and the upper body portion being removably held together and configured to simulate a toy vehicle;

a front surface engaging wheel assembly resiliently held to the base by means of an axle held between a pair of wheels; and

a unitary spring-powered motor and rear surface engaging driving wheel assembly pivotably mounted within the base of the housing by means of a pivot rod held to said motor and captured within said base; the rear assembly including an axle and a pair of rear drive wheels connected with a gear train held within the spring-powered motor assembly; and detent means, having a plurality of fingers thereon fixed to the rear axle for rotation therewith; the base including an opening formed therein in alignment with said detent means on the rear axle; an





integral arm formed on the base and extending into the opening to enable the arm to coact with the fingers of the detent means in one position to lock the spring-powered motor assembly in the wound position; whereby the spring-powered motor assembly may be unwound to accelerate the toy vehicle by the quick application and removal of a light force to the rear of the top portion of the vehicle to thereby rotate the base and top portion of the vehicle around said pivoted rod, in relation to the unitary spring-powered motor assembly, to a second position to thereby release the detent means from the integral arm.

4,536,170

ELASTOMERIC SHEAR SHAFT COUPLING

Holmes A. Downey, Simpsonville, S.C., assignor to Reliance Electric Company, Greenville, S.C.

Filed May 25, 1984, Ser. No. 613,820

Int. Cl.³ F16D *3/58*

U.S. Cl. 464—80 **14 Claims**

1. An elastomeric shear shaft coupling for connecting two rotatable shafts in end-to-end relationship, said coupling comprising:

a. annular coupling hubs for mounting on the adjacent ends of the shafts;

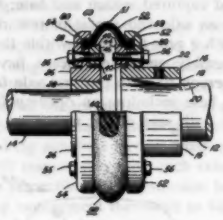
b. a generally circular flexible element of elastomeric material being of a substantially parabolic cross-sectional shape and extending between said hubs and having laterally extending right and left margins for contacting said hubs;

c. a bead of elastormeric material, with a higher durometer value than that of the body of said element, disposed within each of said margins;

d. a plurality of fabric plies interspersed within said elastomeric material for reinforcing said element, said plies

being concentrated near the centroid of said element and terminating at each side adjacent said beads;

e. clamping means for retaining said margins in place against said hubs; and



f. fastening means for securing said clamping means and said element to said hubs.

4,536,171

METHOD AND APPARATUS FOR CONTROLLING CONTINUOUSLY VARIABLE TRANSMISSION

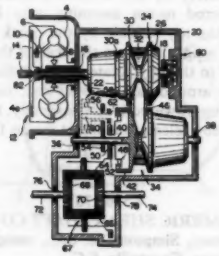
Yoshikazu Tanaka, Yokohama; Keiju Abo; Hiroyuki Hirano, both of Yokosuka; Haruyoshi Kumura, Yokohama; Sigeaki Yamamuro, Zushi, and Yoshiro Morimoto, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 13, 1983, Ser. No. 494,572

Claims priority, application Japan, May 14, 1982, 57-80023

Int. Cl.³ F16H *11/06*; B60K *41/06*

U.S. Cl. 474—28 **18 Claims**



1. A method for controlling a continuously variable transmission of an automotive vehicle having an internal combustion engine, the transmissiion being shiftable between different reduction ratios and having a shift motor which is rotatable for effecting shifting between reduction ratios, the method comprising:

detecting a state wherein a rapid shifting between reduction ratios is needed and generating a rapid shifting need indicative signal;

rotating the shift motor at a first revolution speed in response to absence of said rapid shifting need indicative signal; and

rotating the shift motor at a second revolution speed which is higher than said first revolution speed in response to presence of said rapid shifting need indicative signal thereby to shorten the time required for shifting between reduction ratios.

4,536,172

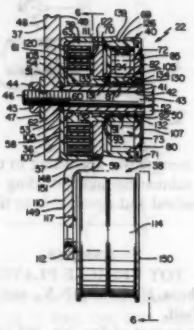
BELT TENSIONER AND METHOD OF MAKING THE SAME

Lee R. Burris, Porter Township, Dade County; Billy L. Speer, Springfield, and Melvin D. Gayer, Rock Prairie Township, Dade County, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Feb. 21, 1984, Ser. No. 581,645

Int. Cl.³ F16H *7/08*

U.S. Cl. 474—135 **20 Claims**



1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and fluid dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means in at least one direction of movement thereof, said fluid dampening means comprising a rotary dampening means, said rotary dampening means and said spring means being coaxially aligned, said rotary dampening means comprising an outer ring member and an inner ring member disposed in said outer ring member, said members being arranged for relative rotational movement therebetween, said outer ring member being operatively interconnected to said support means, said inner ring member being operatively interconnected to said belt engaging means, said support means comprising a cup-shaped housing means containing said spring means therein and having a closed end means and an open end means, said housing means being operatively interconnected to said outer ring member, the improvement wherein part of said open end means of said housing means extends over said outer ring member and is secured thereto.

4,536,173

CUP MAKING APPARATUS WITH LUBRICATING MEANS

Craig Puls, Slinger, Wis., assignor to Holiday Cups, Inc., Menomonee Falls, Wis.

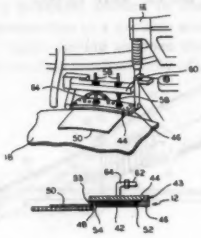
Filed Feb. 24, 1983, Ser. No. 469,217

Int. Cl.³ B31B *49/02*

U.S. Cl. 493—149 **5 Claims**

1. An apparatus for making cups which includes means for forming blanks of a cup sidewall portion, means for forming the cup sidewall blank into a frusto-conical configuration by sealing the opposite edges and for applying a bottom portion, and means for curling and rolling the upper edge of the cup to form a rim, the improvement comprising a lubricant applicator disposed between the blank forming means and the cup form-

ing means and constructed and arranged for applying lubricant to the upper edge of the blank prior to formation of said cup to minimize frictional heating during the rim forming operation, said lubricant applicator including arcuate wick means and a carrier for said wick means, means mounted on said carrier for supplying lubricant to said wick means, said carrier being reciprocally mounted on said apparatus for moving the wick means into and out of engagement with the edge of successive cup sidewall blanks after the same have been formed by said blank forming means so that lubricant will be applied to the edge of said blanks.



4,536,174

STACK CONVEYOR FOR BAG-MAKING APPARATUS

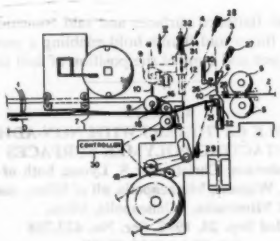
Karl Dreckmann, Hennef-Altenbödingen, Fed. Rep. of Germany, assignor to M. Lehmacher & Sohn GmbH Maschinenfabrik, Niederkassel-Mondorf, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,119

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1981, 3151848

Int. Cl.³ B65H *5/02*

U.S. Cl. 493—194 **6 Claims**



1. An apparatus for making bags from a multilayer synthetic-resin strip workpiece, the apparatus comprising:

transport means for conveying the workpiece longitudinally in a transparent direction along a path;

an upper welding tool along the path;

a lower welding tool along the path beneath the upper tool;

means for heating at least one of the tools;

conveyor means extending along the path downstream of the tools and having a horizontal conveyor surface positioned to receive the workpiece after same is conveyed by the transport means past the welding tools;

holddown means including a movable holddown element displaceable vertically and at least partially displaceable horizontally above the conveyor surface; and

drive means connected to one of the welding tools and to the transport, conveyor, and holddown means for generally synchronously vertically and codirectionally displacing the one welding tool and the holddown element and for synchronously horizontally and codirectionally displacing the conveyor surface and holddown element, the holddown element being a vertically displaceable roller rotatable by the drive means at a peripheral speed equal to the displacement speed of the conveyor surface, said drive means including:

a rotatable drive wheel jointly vertically displaceable with the roller and operatively engageable with the conveyor surface, whereby when engaging the conveyor surface the drive wheel is rotated thereby; and

an endless drive member looped over the wheel and over the roller.

4,536,175

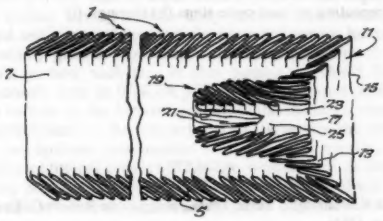
METHOD AND APPARATUS FOR MAKING IMPROVED END-CLOSURES FOR SHIRRED TUBULAR CASINGS

Lionel C. Arnold, Columbia, S.C., assignor to Teepak, Inc., Oak Brook, Ill.

Filed Jun. 6, 1983, Ser. No. 501,669

Int. Cl.³ A22C *13/00*

U.S. Cl. 493—308 **22 Claims**



1. A method of forming an end-closure inside the bore of a shirred strand of tubular casing, which comprises deshirring the terminal pleats of one end of the strand, inverting the deshirred casing into the bore of the strand, winding the deshirred casing inside the bore into an end-closure plug, and inverting shirred casing into the bore as the plug is formed wherein the walls of the inverted casing immediately adjacent to the end of the strand are tapered and remain substantially pleated.

4,536,176

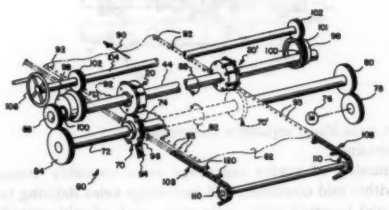
CRIMP BLADE HOLDER

Richard A. Gaspar, Dayton, Ohio, assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Sep. 21, 1983, Ser. No. 534,514

Int. Cl.³ B42B *2/00*

U.S. Cl. 493—365 **7 Claims**



3. A method of applying crimps to a moving web along a line parallel to the direction of movement of the web, comprising the steps of:

(a) applying a first crimp to the web;

(b) applying a next crimp to the web at a spacing from the preceding one of said crimps of substantially 2.0 (5.08 cm) inches;

(c) applying a next crimp to the web at a spacing from the

preceding one of said crimps of substantially 2.0 inches (5.08 cm);

(d) applying a next crimp to the web at a spacing from the preceding one of said crimps of substantially 2.0 inches (5.08 cm);

(e) applying a next crimp to the web at a spacing from the preceding one of said crimps of substantially 2.0 inches (5.08 cm);

(f) applying a next crimp to the web at a spacing from the preceding one of said crimps of substantially 2.0 inches (5.08 cm);

(g) applying a next crimp to the web at a spacing from the preceding one of said crimps of substantially 2.0 inches (5.08 cm);

(h) applying a next crimp to the web at a spacing from the preceding one of said crimps of substantially 2.0 inches (5.08 cm);

(i) applying a next crimp to the web at a spacing from the preceding one of said crimps of substantially 3.0 inches (7.62 cm); and

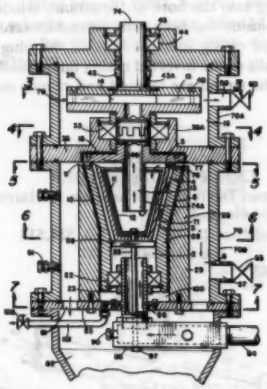
(j) repeating at least once steps (b) through (i).

4,536,177

SEPARATOR

Donald E. Boatright, Tulsa, Okla., assignor to Robert G. Green, Tulsa, Okla.

Filed Aug. 8, 1984, Ser. No. 639,671
Int. Cl.³ B04B *1/04*
U.S. Cl. 494—44 **16 Claims**



1. A centrifugal separator comprising:

a container;

a plurality of vortex centrifuge veins rotatably mounted within said container, said centrifuge veins defining truncated inverted right angle cone, each of said centrifuge veins flaring upwardly and outwardly with the cross-sectional area increasing as the cone gets larger;

outlet means connected to the upper end of said veins;

inlet means connected to the lower ends of said veins for admitting the fluid to be separated;

means to rotate said veins;

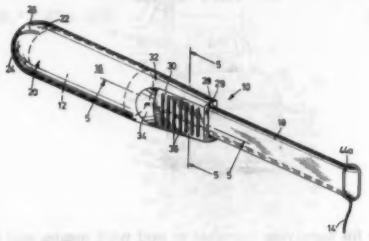
means connected to the outlet means of said veins for directing the denser material in one flow path and the less dense material in second flow path.

4,536,178

TAMPON APPLICATOR

Bernard Lichstein, Elizabeth, N.J., and Michael Handler, Norwalk, Conn., assignors to International Playtex, Inc., Stamford, Conn.

Filed Nov. 10, 1983, Ser. No. 550,684
Int. Cl.³ A61F *15/00*
U.S. Cl. 604—15 **14 Claims**



1. A tampon applicator comprising:

a tubular barrel adapted to house and carry a tampon therein and a slidable, tubular plunger telescopically engageable with said barrel and operable to push the innermost end of the tampon within the barrel out of the forward end of the barrel into a vagina;

said tubular barrel comprising:

(a) a cylindrical front portion adapted to house said tampon;

(b) a rearward portion adapted to partially house and engage said plunger, said rearward portion of said barrel comprising two diametrically opposed, substantially flattened surfaces; and

(c) a transitional section between said rearward portion and said front portion, said transitional section having a reduced diameter relative to said front portion of said barrel;

whereby said flattened surfaces and said transition section provide a finger and thumb hold enabling a user to comfortably eject and control the position of said tampon.

4,536,179

IMPLANTABLE CATHETERS WITH NON-ADHERENT CONTACTING POLYMER SURFACES

Michael H. Anderson; Christopher S. Lyons, both of St. Paul, and Bruce D. Wigness, Minneapolis, all of Minn., assignors to University of Minnesota, Minneapolis, Minn.

Filed Sep. 24, 1982, Ser. No. 422,758
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—266 **8 Claims**

1. A catheter for long term implantation within a living body composed of concentric tubular elements of flexible inert nontoxic biocompatible polymeric material and having abutting surfaces between the concentric tubular elements in close face-to-face contact, said catheter characterized by the surface of at least one of said tubular elements having a thin film glow discharge plasma polymerized fluorocarbon coating to prevent adhesion to the contacting surface of the other concentric tubular element.

4,536,180

SURGICAL INSTRUMENT FOR SUCTION LIPOLYSIS

Gerald W. Johnson, 17070 Red Oak, #301, Houston, Tex. 77090

Filed Jul. 22, 1983, Ser. No. 516,038
Int. Cl.³ A61M *27/00*
U.S. Cl. 604—268 **11 Claims**

1. A surgical instrument for use in suction lipolysis on living human beings, comprising

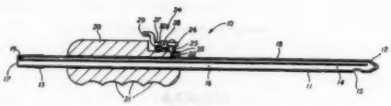
an elongated tube having one end with a tapered, substan-

tially pointed, closed end having a round tip of a size and shape for insertion under the skin, and another end open for connection to a vacuum source,

said tube having an opening on one side only at said one end a short distance from said pointed round tip closed end,

a handle surrounding and secured to the other end of said tube, with a sufficient amount of the tube behind the handle for connection to a vacuum source,

a passageway means having an open end adjacent to said handle and extending longitudinally of said tube, along the



side opposite to said side opening, adjacent to the passage therein and having an end opening into said tube adjacent to the inside of said pointed round tip closed end at a point beyond said tube side opening, and

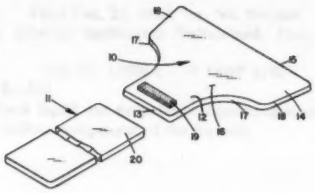
valve means supported on said handle on the side opposite to said side opening, having a position normally closing said passageway means open end, and moveable to open and close said passageway means to control introduction of air to the closed end of said tube for clearing obstruction during use.

4,536,181

SANITARY NAPKIN WITH IMPROVED PROTECTION

Linda E. Cook, 4314 Lasalle Ave., Baltimore, Md. 21206

Filed Apr. 3, 1984, Ser. No. 596,318
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—387 **8 Claims**



1. A back panty shield for a sanitary napkin, comprising a disposable unitary member having a forward portion and a rearward portion, each of which has a respective end edge, the shield further having a main body portion intermediate its forward and rearward portions, the rearward portion having a substantially greater transverse width than the width of the forward portion, such that in plan outline the shield flares continuously from its forward portion to its rearward portion, means carried by the forward portion of the shield for removable attachment to the sanitary napkin, whereby the shield forms an optional continuation of the sanitary napkin and provides additional protection for the wearer such as during sleeping hours, and further means carried by the shield for removable attachment to an undergarment of the wearer.

4,536,182

BATH AND METHOD FOR THE SIMULTANEOUS DESIZING AND BLEACHING OF FABRICS

Gerárd Tatin, Creil, France, assignor to Atochem, Paris, France

Filed Mar. 7, 1984, Ser. No. 587,214
Claims priority, application France, Mar. 22, 1983, 83 04646
Int. Cl.³ D06L *1/06, 3/02;* C11D *7/54*
U.S. Cl. 8—107 9 Claims

1. A bath for the simultaneous desizing and bleaching of fabrics comprising hydrogen peroxide, a sequestering agent, an amylase, a surfactant, and a buffer consisting essentially of sodium tetraborate decahydrate.

4,536,183

MANGANESE BLEACH ACTIVATORS

James S. Namnath, Bergenfield, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 9, 1984, Ser. No. 597,971
Int. Cl.³ C11D *3/39, 7/18*
U.S. Cl. 8—107 27 Claims

1. A catalyst for the controlled decomposition of peroxy compounds comprising a water-soluble manganese (II) salt adsorbed onto a solid inorganic silicon support material, wherein the ratio of manganese (II) to inorganic silicon support material ranges from 1:1000 to 1:10, the combination having been prepared at a pH from 7.0 to 11.1 and where the amount of manganese (II) does not exceed the adsorptive capacity of the inorganic silicon or alumina support material.

4,536,184

OVERPRINTING OF DYE COLORED POLY(VINYL CHLORIDE) RESINS

Thomas D. Ryan, Escondido, Calif., assignor to Formulabs Industrial Inks, Inc., Escondido, Calif.

Continuation-in-part of Ser. No. 559,893, Dec. 12, 1983. This application Nov. 14, 1983, Ser. No. 550,828
Int. Cl.³ D06P *5/00*
U.S. Cl. 8—508 10 Claims

1. In the process of overprinting on poly(vinyl chloride) resin substrate colored by solvent soluble dye present within said poly(vinyl chloride) resin mass or deposited on the surface of said poly(vinyl chloride) resin, the improvement which comprises:

overprinting at least a part of the surface of said dye colored poly(vinyl chloride) resin substrate with a liquid, nonflammable coloring agent consisting essentially of

(i) liquid, nonflammable, halogenated hydrocarbon solvent having 1–4 carbon atoms, where halo is chloro, fluoro, or both;

(ii) pigment dispersed in said halohydrocarbon solvent; and

(iii) film former, dissolved in said halohydrocarbon solvent consisting essentially of

(a) a resin selected from the class consisting of acrylic resins, methacrylic resins, and resin copolymers or acrylates and methacrylates; or

(b) a combination of said resin defined in (a) above and isotactic chlorinated polypropylene, said combination having at least 50% by weight of said resin defined in (a) above;

for a time to color said substrate surface; and heat treating said overprinted substrate to adhere said pigment and said film former, in the overprinted area.

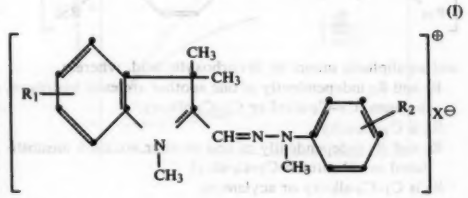
4,536,185

LIQUID PREPARATION OF CATIONIC DYE MIXTURE CONTAINING ALIPHATIC CARBOXYLIC ACID FOR BLACK DYEING

Arnulf R. Läpple, Aesch, and Alex Nicopoulos, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

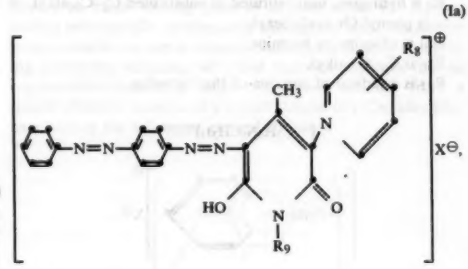
Filed Dec. 23, 1983, Ser. No. 564,860
Claims priority, application Switzerland, Dec. 28, 1982, 7587/82
Int. Cl.³ C09B *67/34;* D06P *1/41*
U.S. Cl. 8—527 7 Claims

1. A black liquid dye preparation consisting essentially of a cationic yellow component of the formula



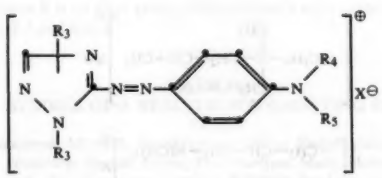
(I)

or



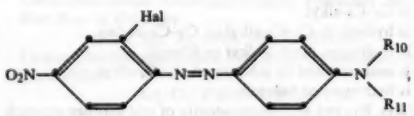
(Ia)

a cationic red component of the formula



(II)

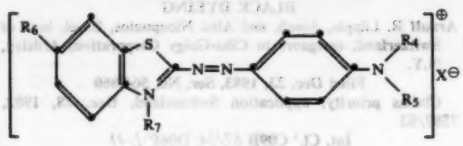
or



(IIa)

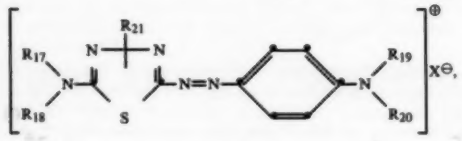
and a cationic blue component of the formula

(III)



or

(IIIb)



and an aliphatic mono- or di-carboxylic acid, wherein

R_1 and R_2 independently of one another are each hydrogen, halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R_3 is C_1–C_4-alkyl,

R_4 and R_5 independently of one another are each unsubstituted or substituted C_1–C_4-alkyl,

R_6 is C_1–C_4-alkoxy or acylamino,

R_7 is C_1–C_4-alkyl,

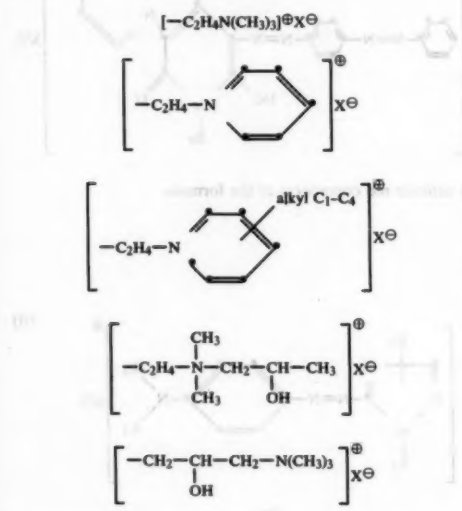
R_8 is hydrogen or methyl,

R_9 is hydrogen, unsubstituted or substituted C_1–C_6-alkyl, or is phenyl Or cyclohexyl,

Hal is chlorine or bromine,

R_{10} is C_1–C_4-alkyl,

R_{11} is a radical of any one of the formulae



R_{12} is C_1–C_4-alkyl,

R_{13} is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R_{14} is hydrogen, C_1–C_4-alkyl or Phenyl,

R_{15} is unsubstituted or substituted C_1–C_4-alkyl,

R_{16} is hydrogen or halogen,

R_{17}, R_{18}, R_{19} and R_{20} independently of one another are each unsubstituted or substituted C_1–C_6-alkyl, or R_{17} forms with R_{18}, with inclusion of the N atom and optically further hetero atoms, a heterocyclic 5- or 6-membered ring,

R_{21} is unsubstituted or substituted C_1–C_3-alkyl,

X is an anionic radical,

and optionally water, organic solvents and conventional additives.

4,536,186

USE OF POLY (DMDAAC) AS COAL FINE SLURRY VISCOSITY REDUCER

Paul A. Rey, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed May 2, 1984, Ser. No. 606,046
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 **2 Claims**

1. A method of reducing the viscosity of a 40%–60% coal fine/40–60% water slurry which comprises adding 1 to 10 lbs per ton of dry coal of poly(dimethyl diallyl ammonium chloride) to the slurry, wherein said coal fine slurry has been treated so as to substantially remove clay and impurities prior to addition of said poly(dimethyl diallyl ammonium chloride).

4,536,187

COMPOSITIONS COMPRISING COAL, WATER AND POLYELECTROLYTE

Bertil V. Hansen, Helsingborg; Sten S. Kelfve, Påarp, and Henri R. Mollberg, Helsingborg, all of Sweden, assignors to AB Carbogel, Helsingborg, Sweden

PCT No. PCT/SE82/00279, § 371 Date May 12, 1983, § 102(e) Date May 12, 1983, PCT Pub. No. WO83/01069, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 13, 1982, Ser. No. 495,355
Claims priority, application Sweden, Sep. 22, 1981, 8105583
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 **15 Claims**

1. A composition comprising finely divided coal, water, and at least one polyelectrolyte, wherein the concentration of water of the composition is in the range from 15 to 40 percent by weight of the composition, and the concentration of said polyelectrolyte is in the range from 0.01 to 5 percent by weight of the composition, and wherein said polyelectrolyte has an average molecular weight below 5×10^6 and is a water-soluble polyethylene substituted directly on the polyethylene chain with (a) hydroxysulfonyloxy groups, or (b) hydroxysulfonyloxy-lower alkyl groups, which are partly or completely in salt form, and wherein the amount of sulfur of the polyelectrolyte is 2 to 25 percent by weight being calculated when the acid-forming groups are present as free acids.

4,536,188

ALCOHOL COMPOSITIONS HAVING LUMINOUS FLAMES

Clinton J. de Witt, 610 Laurel Dr., Sacramento, Calif. 95825, and Ron Reese, 4957 Buftwood Way, Sacramento, Calif. 95841

Filed Jul. 31, 1984, Ser. No. 636,281
Int. Cl.³ C10L *1/30*; C12F *5/00*
U.S. Cl. 44—53 **2 Claims**

1. An alcohol composition intended as a fuel strictly for racing cars and comprising a major proportion of methanol and about 0.5 weight percent to about 10.0 weight percent of trimethyl borate that imparts a characteristic green colored flame when burned, thereby precluding a potentially hazardous situation from developing because of the otherwise virtually colorless flame associated with the burning of alcohol as a fuel in racing cars.

4,536,189

CORROSION INHIBITOR AND MOTOR FUEL COMPOSITION CONTAINING THE SAME

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,768
Int. Cl.³ C10L 1/22
U.S. Cl. 44—56 7 Claims

1. A novel composition prepared by (a) reacting substantially equal molar amounts of maleic anhydride and a hydrocarbon-substituted mono primary amine or a hydrocarbon-substituted mono primary ether amine at a temperature ranging from 75 to 150 C. to produce a maleamic acid intermediate reaction product, and (b) reacting said intermediate product of (a) with a substantially equal molar amount of a heterocyclic compound selected from the group consisting of 5-amino-1,3,4,-thiadiazole-2-thiol and benzotriazole at an elevated temperature to produce said composition, said hydrocarbon-substituted mono primary amine being represented by a formula:

$$R—NH_2$$

in which R is a monovalent hydrocarbyl radical having from about 6 to about 20 carbon atoms or a hydrocarbyl aminoalkylene radical in which the hydrocarbyl group has from 6 to about 20 carbon atoms and in which the divalent alkylene group has from about 2 to 3 carbon atoms, and said hydrocarbon-substituted mono primary ether amine being represented by the formula:

$$R—[O(CH_2)_n]_x\left[OCH_2—\underset{CH_3}{\underset{|}{CH}}\right]_y—NH_2$$

in which R is a hydrocarbyl radical having from about 6 to about 20 carbon atoms and when y is 0, x is 1 and n is an integer from 1 to 4 and when x is 0, y has a value of 1 to 10.

4,536,190

CETANE IMPROVER COMPOSITION

Paul D. Seemuth, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 2, 1984, Ser. No. 596,043
Int. Cl.³ C10L 1/08, 1/22
U.S. Cl. 44—57 11 Claims

1. A desensitized cetane improver for use in diesel fuel, said cetane improver comprising a mixture of (a) at least one compound having a 50% explosion Drop Weight Rating of less than 20 Kg centimeters as measured by ASTM Method D-2540 and being capable of giving a greater cetane increase than an equal weight of any C_5 to C_{12} alkyl nitrate and (b) a nitric acid ester of a bicyclic or tricyclic alcohol containing a four-membered or five-membered ring in an amount sufficient to increase the ASTM D-2540 rating of the mixture to a value of at least 40 Kg cms.

4,536,191

ESTER-CONTAINING HALOPOLYALKYLENES

Michael I. Naiman, St. Louis, and John A. Schield, Chesterfield, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 432,494, Oct. 4, 1982, , which is a continuation-in-part of Ser. No. 356,994, Mar. 11, 1982, Pat. No. 4,471,098. This application Jul. 2, 1984, Ser. No. 626,831
Int. Cl.³ C10L 1/22
U.S. Cl. 44—62 10 Claims

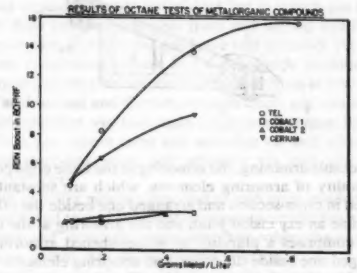
1. A fuel oil containing an effective pour point depressing amount of ester-containing halogpolyalkylene characterized by internal olefinic unsaturation, by being essentially free of crosslinking, by having a branch index of from about 2 to about 20 and by having a halogen content of from about 0.001 percent to less than about one percent by weight based on polyalkylene and, conversely, having an ester content of greater than about 99 percent.

4,536,192

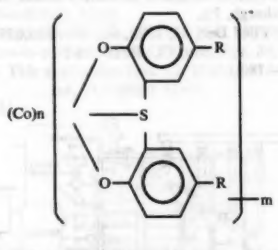
ADDITIVES FOR IMPROVING THE RESEARCH OCTANE NUMBER OF LIQUID HYDROCARBON FUELS

Milton Braid, Westmont, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,682
Int. Cl.³ C10L 1/30
U.S. Cl. 44—68 2 Claims



1. A method of increasing the octane research number of liquid hydrocarbon fuels, selected from hydrocarbon fractions having an initial boiling point of at least about 75° F., and boiling substantially continuously throughout their distillation range, suitable for use in internal combustion engines comprising intimately admixing with said hydrocarbon base fuel an organosulfur-containing metal compound selected from a minor effective amount of a cobalt thiobis (C_1–C_{30} alkylphenate having the following general structure



where R is an alkyl group of from about 4 to 16 carbon atoms, m is 3 and n is 2.

4,536,193

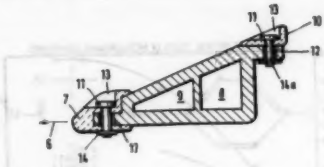
STIRRER OF A REACTOR FOR GASIFYING SOLID FUELS

Johannes Albrecht, Frankfurt am Main; Rudolf Jakobs, Bad Homburg; Osman Turna, Frankfurt am Main; Helmut Vierrath, Neu-Isenburg; Manfred Weil, Rockenberg, and Klaus Zapke, Maintal, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 27, 1983, Ser. No. 536,147
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239320
Int. Cl.³ C10J 3/30, 3/32
U.S. Cl. 48—77 7 Claims

1. In a reactor for gasifying granular fuels, particularly coal, under a pressure of 5 to 150 bars by a treatment with gasifying

agents which contain free oxygen, steam and/or carbon dioxide, wherein the fuel forms in the reactor a descendable fixed bed, means for introducing the gasifying agents into the fixed bed from below, means for withdrawing the incombustible mineral constituents of the fuel below the fixed bed as solid ash or liquid slag, and at least one stirring arm in the fixed bed which is rotatable about a vertical axis and is approximately triangular in cross-section and has a knife edge penetrating through the fixed bed and a rear crushing edge, which is the top rear edge, the improvement wherein each of the knife edge and the crushing edge of the stirring arm is provided with a



replaceable armoring, the armoring at the knife edge comprises a plurality of armoring elements, which are substantially V-shaped in cross-section and arranged one beside the other so as to define an expansion joint, and the armoring at the crushing edge comprises a plurality of wedge-shaped armoring plates arranged one beside the other, said armoring elements and said armoring plates being mounted on the stirring arm so as to be movable at ambient temperature and said armoring elements and said armoring plates having a width of 5 to 50 cm measured in the direction which is parallel to the radial extent of the arm.

4,536,194

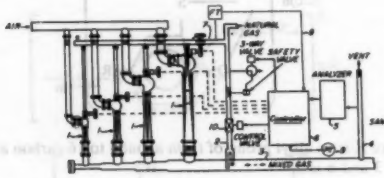
SYSTEM FOR CONTROLLING THE COMPOSITION OF A FUEL GAS PRODUCED BY A JET COMPRESSOR SYSTEM

William E. Boggs, Murrysville, and Everett L. Keener, Monroeville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 12, 1983, Ser. No. 560,657

Int. Cl.³ B01F *3/02*

U.S. Cl. 48—180.1 **8 Claims**



1. Method of providing a mixture of lean gas and rich gas of a desired composition by means of a jet compressor system comprising two or more jet compressors, and wherein each such jet compressor operates by passing said rich gas at high pressure through a nozzle into the throat of a venturi section to thereby produce suction which draws said lean gas at a lower pressure into said venturi section to thereby dilute said rich gas to a predetermined composition, comprising:

(1) adjusting the jet compressor system being used to mix said lean gas and said rich gas to provide a leaner gas mixture than said desired composition;

(2) then adding a predetermined amount of said rich gas to said leaner gas mixture to attempt to obtain said desired composition; and

(3) adding a varying amount of said rich gas to said leaner gas mixture in response to measurements of the flow of said rich gas going into said jet compressor system and the pressure of the mixed gases after the addition of said rich gas to thereby obtain the gas mixture having said desired composition.

4,536,195

METHOD OF MAKING GRINDING STONES

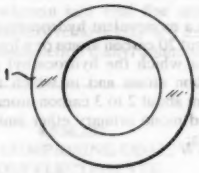
Tadayuki Ishikawa, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo; Noritake Co., Ltd., Nagoya and Noritake Diamond Industries Co., Ltd., Ukiha, all of, Japan

Filed Oct. 1, 1984, Ser. No. 656,372

Claims priority, application Japan, Sep. 30, 1983, 58-180629; Apr. 12, 1984, 59-71722

Int. Cl.³ B24D *17/00*

U.S. Cl. 51—293 **41 Claims**



1. A method of making a grinding stone, which comprises:

forming on a surface of a binder sheet of a desired configuration a pattern of electrically conductive layers for selectively controlling sites on said surface to be bonded with abrasive grains;

immersing the sheet in an electrolytic bath containing metallic ions and having abrasive grains dispersed therein;

fixedly mounting on the pattern of electrically conductive layers the abrasive grains by means of metals deposited by electric paths flowing between said conductive layers and an opposite electrode in the bath;

piling in layers a plurality of the binder sheets mounted with the abrasive grains; and

warm or hot pressure-molding the layers into an integrate of the grinding stone.

4,536,196

COATED DIFFUSION MEMBRANE AND ITS USE

Jesse R. Harris, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 185,712, Sep. 10, 1980, abandoned. This application Mar. 16, 1982, Ser. No. 358,570

Int. Cl.³ B01D *53/22*

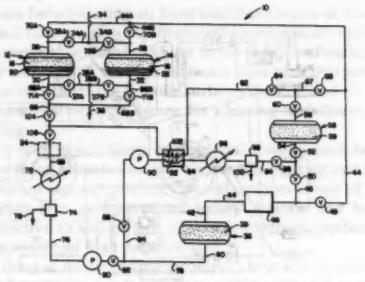
U.S. Cl. 55—16 **9 Claims**

1. A process for the dehydrogenation of a hydrocarbon comprising effecting, in the presence of a membrane, said dehydrogenation of said hydrocarbon under dehydrogenation conditions and at a temperature in the range of about 800° to about 1300° F. to produce an unsaturated hydrocarbon and hydrogen in a reaction zone; wherein said membrane is selectively permeable to said hydrogen; wherein said hydrogen produced during said dehydrogenation is continuously removed from said reaction zone by diffusion through said membrane; wherein said membrane comprises (a) a member of the group consisting of palladium and palladium alloys, and (b) at least one metal selected from the group consisting of the transition metals of Group IVB, Group VB and Group VIB of the Periodic Table of Elements; and wherein the surface of (a) is coated with (b).

4,536,197
PROCESS AND APPARATUS FOR REMOVING ADSORBED MATERIAL FROM AN ADSORBER

Thomas E. Cook, 3570 Maize Rd., Columbus, Ohio 43224

Filed Sep. 16, 1983, Ser. No. 532,835
Int. Cl.³ B01D 53/04
U.S. Cl. 55—28 15 Claims



1. A process for removing adsorbed material from an adsorber comprising:

(a) passing a stream of non-condensible gas successively through a heat storage means, an auxiliary adsorber and in one direction through a main adsorber, thereby transferring heat from said heat storage means to said auxiliary adsorber and said adsorber, removing at least part of any adsorbed material from said auxiliary adsorber and at least part of said adsorbed material from said main adsorber, said gas leaving said main adsorber being passed through a condensing means to condence at least part of said adsorbed material carried by said gas;

(b) thereafter passing said stream of gas successively through said heat storage means, said main adsorber thereby continuing to transfer heat from said heat storage means to said main adsorber and to remove adsorbed material from said adsorber, while isolating said auxiliary adsorber from said stream of gas, thereby permitting said auxiliary adsorber to cool and

(c) passing said stream of desorption gas successively in the opposed direction through said main adsorber through said heat storage means and through said auxiliary adsorber, thereby transferring heat from said main adsorber to said heat storage means and adsorbing at least part of any of said adsorbed material removed from said main adsorber in said auxiliary adsorber.

8. An adsorption apparatus comprising:

(a) a main recycling circuit including:

a main adsorber having an inlet and an outlet;

an adsorber inlet duct for passing a stream of contaminated gas into said inlet of said adsorber;

an adsorber outlet duct for exhausting said stream of gas from said outlet of said adsorber;

a heat storage means having an inlet and an outlet;

an auxiliary adsorber having an inlet and an outlet;

a first desorption duct extending from said outlet of said heat storage means to said inlet of said auxiliary adsorber;

a second desorption duct extending from said outlet of said auxiliary adsorber to said inlet of said main adsorber;

a third desorption duct for passing gas from said outlet of said heat storage means to said inlet of said main adsorber without passing said gas through said auxiliary adsorber;

a first valve means for controlling the flow of gas through said first, second and third desorption ducts, said first valve means having a first position in which said third desorption duct is closed so that gas can only pass from said outlet of said heat storage means to said inlet of said main adsorber via said auxiliary adsorber, and a second position, in which said third desorption duct is open and at least one of said first and second desorption ducts are closed so that gas can pass from said outlet of said heat storage means to said inlet of said main adsorber, but cannot pass through said auxiliary adsorber;

a main condensing means, connected to said outlet of said main adsorber, for condensing condensible matter in gas leaving said outlet of said adsorber;

a second valve means for switching said main adsorber between adsorption and desorption phases; said second valve means having an adsorption position in which gas can flow through said adsorber from said adsorber inlet duct to said adsorber outlet duct but in which gas cannot flow into said adsorber from said second and third desorption duct nor can gas leave said adsorber via said main condensing means; and a desorption position, in which gas can enter said main adsorber from at least one of said second and third desorption ducts and can leave said adsorber via said main condensing means but in which gas cannot enter said adsorber via said adsorber inlet duct nor leave said adsorber via said adsorber outlet duct;

a main impeller means connected to said main condensing means and to said heat storage means to cause the gas to enter and leave the main adsorber when the second valve means is in its desorption position;

(b) an auxiliary recycle circuit between the heat storage inlet and the main adsorber outlet comprising;

a first reheating duct connecting said inlet of said heat storage means to said inlet of said auxiliary adsorber;

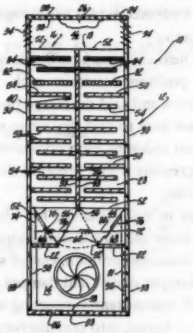
a second reheating duct connecting said outlet of said auxiliary adsorber to said outlet of said main adsorber; and

a third valve means for opening and closing said first and second reheating ducts.

4,536,198
MOISTURE CONTROL DEVICE

Don R. Strain, Clarkston, Mich., assignor to Hydro-Dri Systems, Inc., Southfield, Mich.

Continuation-in-part of Ser. No. 441,354, Nov. 15, 1982, , which is a continuation-in-part of Ser. No. 259,121, Apr. 30, 1981, Pat. No. 4,419,835. This application Dec. 12, 1983, Ser. No. 560,778
Int. Cl.³ B01D 53/04
U.S. Cl. 55—33 23 Claims



1. A method of drying air for use with a dehumidifier or dehydrator, comprising the following steps:

(a) forcing ambient air at a low static pressure through an inlet into a housing;

(b) means directing said ambient air into one of a pair of opposed desiccant columns, contained within said housing;

(c) intermittently directing said ambient air into the other of said desiccant columns before said desiccant column approaches saturation and before said desiccant column loses the heat of adsorption contained therein;

(d) passing said ambient air both over the surfaces of a plurality of spaced laterally staggered baffles containing a desiccant, within said columns, and through said spaced baffles, drying said ambient air;

(e) creating a back pressure in a discharge plenum of said housing by directing dry air into said discharge plenum and a large portion thereof out through at least one restricted outlet;

(f) directing a portion of said dry air received in said discharge plenum into said other desiccant column;

(g) directing said portion of dry air both over the surfaces of said spaced desiccant baffles, within said other desiccant columns, and through said spaced baffles, within said other desiccant column, regenerating the desiccant in said baffles; and

(h) directing the air received from said opposed desiccant column of said housing.

9. A moisture control device comprising:

an enclosed housing including an inlet and at least one outlet;

opposed first and second desiccant columns on each side of said inlet and outlet;

a discharge plenum located between said outlet and said opposed desiccant columns;

said inlet and discharge plenum communicating through said desiccant columns;

a valve damper means supported within said housing having a portion directing air received from said inlet into one of said desiccant columns in a first position and into the other opposed desiccant column in a second position;

damper actuating means intermittently positioning said valve damper means between said first and second positions to alternately and intermittently direct air into one of said first and second desiccant columns;

blower means providing pressurized air through said inlet;

heater means, positioned within each of said desiccant columns in the air path therein, adapted for heating the dehydrated air passing through said column, rendering said dry air more hydroscopic for rapid regeneration of said desiccant columns;

at least one heat collecting baffle assembly of heat collecting material positioned within each column between said heater means and said discharge plenum preventing radiation of said heat to said dry air in said discharge plenum;

said desiccant columns each comprising baffles of desiccant material creating a low pressure drop through said desiccant column;

valve means in said housing for alternately directing air received from said discharge plenum through said other opposed desiccant column, out of said housing;

said valve damper means and damper actuating means alternately and intermittently directing said air into one of said desiccant columns, into said discharge plenum, and a large portion of said air out of said outlet;

said outlet a restricted opening creating a back pressure in said discharge plenum and directing a portion of the air received in said discharge plenum into said other opposed desiccant column; and

said valve means directing said portion of air received from said opposed desiccant column out of said housing.

4,536,199

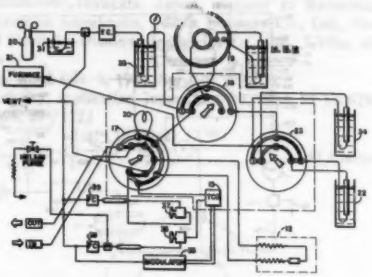
GAS CHROMATOGRAPH FOR RESEPARATING A SAMPEL INTO PURE COMPONENTS

Michael B. Toon, De Soto, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 5, 1984, Ser. No. 568,462

Int. Cl.³ B01D *15/08*

U.S. Cl. 55—67 **10 Claims**



1. A gas chromatograph for separating the components of a sample comprising:

a chromatographic column for separating said sample into its components;

a detector for measuring the properties of said components;

means for holding said sample and connecting it to said detector;

a plurality of traps for trapping the components of said sample;

a first valve selectively connecting said means for holding said sample to an external source of sample or to a component trapped in one of said traps and;

a second valve for selectively connecting said traps to supply a component trapped in one of said traps to said detector or to supply a component passing through said detector to one of said traps so that the trapped components can be reseparated.

4,536,200

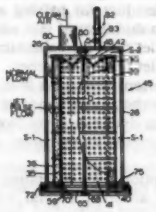
GAS FILTER APPARATUS AND METHOD OF FILTERING

Parker C. Reist, 205 Glenhill La., Chapel Hill, N.C. 27514

Filed Oct. 3, 1983, Ser. No. 538,758

Int. Cl.³ B01D *46/02, 50/00*

U.S. Cl. 55—96 **10 Claims**



1. A gas-filtering apparatus for filtering particulate-laden gas, comprising:

(a) a first clean air plenum to which filtered gas is admitted, a second scavenging gas plenum isolated from said first plenum for containing unfiltered scavenging gas and having a barrier between said plenums with apertures communicating said plenums for gas flow therebetween;

(b) a plurality of filters located for filtering said scavenging

gas, each of a standard cylindrical construction comprising a hollow cylinder of pleated porous filter paper including means serving to restrain movement of said paper and having one closed end and one open end;

(c) means mounting each said filter on said barrier such that the outer surface thereof communicates with said first plenum and the inner surface and open end thereof communicates with said second plenum through one of said apertures;

(d) means for exhausting air from said first plenum so that in normal flow gas flows through said apertures and through the open end of each said filter to the interior of each said filter and radially through each said filter such that particulates collect on the interior surfaces thereof; and

(e) reverse jet cleaning means for cleaning said filters, including:

(i) for each of said filters a cylindrical housing, each housing being mounted on said barrier and defining said first plenum and surrounding external surfaces of one of said filters in a predetermined spaced relation and being effective to seal off one of said filters from another;

(ii) a source of high pressure gas;

(iii) conduit means having a control valve and connecting the space surrounding a filter within each said housing to said source of high pressure gas; and

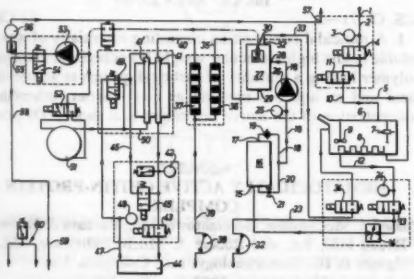
(iv) means for operating said control valve to produce a brief pulse of said high pressure gas for periodically removing particulate matter collected on the interior surfaces of each said filter within one of said housing and causing such removed particulate matter to drop through the open end thereof by directing a said brief pulse of high pressure gas into each said housing to cause such high pressure gas to flow radially inward through each said filter within each said housing in a direction and flow reverse to said normal flow.

4,536,201

SYSTEM FOR VENTING GASES IN FLUIDS PASSING THROUGH A CONDUIT

Fritz L. Brorsson, Flyinge; Bengt A. G. Dahlberg, Lund, and Bengt M. Holmberg, Bjarred, all of Sweden, assignors to Gambro Lundia AB, Sweden

Filed Apr. 24, 1984, Ser. No. 603,309
Claims priority, application Sweden, Nov. 29, 1983, 8306573
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—189 **15 Claims**



1. An apparatus for the venting of gases contained in the fluid passing through a primary conduit in connection with medical treatments comprising:

throttling means interposed in said primary conduit;

pump means downstream of said throttling means for drawing said fluid through said primary conduit;

means for enhanced bubble formation in said fluid positioned between said throttling means and pump means in said primary conduit;

a shunt conduit in fluid communication with said means for enhanced bubble formation and said primary conduit; and

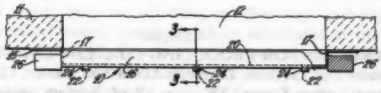
venting means disposed in said primary conduit downstream of said pump means, said venting means for removing gaseous bubbles from said fluid when said fluid is passed therethrough.

4,536,202

DRAIN BUSHING

Richard A. Perkins, Newark; William C. Brady, Granville, both of Ohio, and Paul W. Turner, Aiken, S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 6, 1983, Ser. No. 558,681
Int. Cl.³ C03B *37/00*
U.S. Cl. 65—1 **3 Claims**



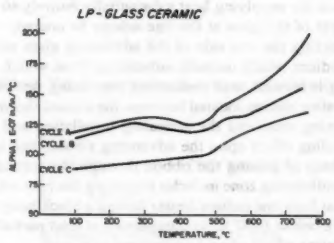
1. A drain bushing for use as a temporary replacement for a production bushing to drain molten glass from a glass melting apparatus including a lower bushing block having a bottom opening and formed of refractory material, the improvements wherein said drain bushing is machined from a single block of dispersion-strengthened, non-precious metal alloy, the machined bushing having (a) an integral upper outwardly-directed mounting flange for abutment with said bushing block to surround the bottom opening therein, (b) an integral central open-topped, convexo-concave well portion beneath said mounting flange for registry with the bushing block bottom opening and having a bottom wall provided with (c) integrally formed tips of rectangular exterior configuration having axial drain passage communicating with the well portion, and electrical contact ears of the same dispersion-strengthened alloy located exteriorally of said well portion and beneath said mounting flange.

4,536,203

PRESSURIZED HEAT TREATMENT OF GLASS-CERAMIC TO CONTROL THERMAL EXPANSION

Daniel P. Kramer, Dayton, Ohio, assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Apr. 19, 1984, Ser. No. 602,035
Int. Cl.³ C03C *27/02*
U.S. Cl. 65—29 **4 Claims**



1. A method for producing a glass-ceramic having a specified thermal expansion value, comprising the steps of:

initially determining the correspondence between pressure during heat treatment of a parent glass and the thermal expansion values of the glass-ceramics that result from

said heat treatment carried out over a range of different pressure levels applied isostatically; and

isostatically pressurizing the parent glass during heat treatment to a preselected pressure level within said range in order to obtain in glass-ceramic having the thermal expansion value corresponding to said pressure level.

4,536,204

PROCESS FOR PRODUCING COATED FLAT GLASS

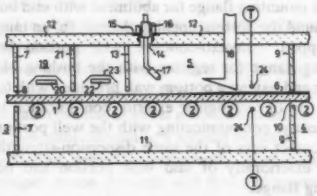
Robert Van Laethem, Loverval; Albert Van Cauter, Charleroi, and Robert Terneu, Thiméon, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed May 9, 1984, Ser. No. 610,087

Claims priority, application United Kingdom, May 13, 1983, 8313283

Int. Cl.³ C03C *17/00*

U.S. Cl. 65—60.4 8 Claims



1. A process for producing flat glass coated on one side with a coating comprised of one of a metal and a metal compound, wherein the glass is formed in a flat glass forming installation and subsequently annealed in an annealing installation, said process comprising:

advancing a freshly formed ribbon of hot flat glass from the flat glass forming installation to the annealing installation;

passing the ribbon through a first thermal conditioning zone located downstream of the glass forming installation for reducing temperature gradients across the ribbon;

passing the ribbon through a second thermal conditioning zone located downstream of the first thermal conditioning zone for supplying heat substantially entirely to a surface layer of the glass at the one side to be coated;

contacting the one side of the advancing glass with a fluid medium which includes substances from which the coating is formed, said contacting step being performed at a coating station located between the second thermal conditioning zone and the annealing installation and having a cooling effect upon the advancing ribbon; and wherein

said step of passing the ribbon through the second thermal conditioning zone includes supplying the heat with the use of at least one radiant heater having a black body temperature below 1100° C. to compensate at least partially for the cooling effect of said contacting step, and

said process further comprises monitoring the temperature of the ribbon surface at the coated side after said contacting step; and controlling the at least one radiant heater so that the coated side complies with predetermined temperature conditions prior to entering the annealing installation.

4,536,205

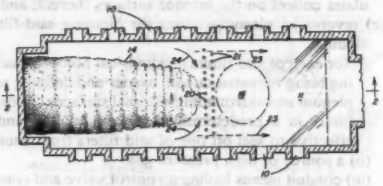
METHOD FOR CONTROLLING CURRENTS IN GLASS MELTER

John F. Krumwiede, Indiana Township, Allegheny County; William C. Harrell, Buffalo Township, Butler County; William G. Hilliard, Lower Burrell, all of Pa., and James E. Harris, Wichita Falls, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 543,735, Oct. 20, 1983,. This application Jul. 23, 1984, Ser. No. 633,559

Int. Cl.³ C03B *5/18*

U.S. Cl. 65—135 9 Claims



1. A method of melting glass comprising feeding a layer of glass batch materials onto a pool of molten glass at an upstream end of a furnace, withdrawing molten glass at a downstream end of the furnace longitudinally spaced from the upstream end, providing heat to the furnace above the pool of molten glass so as to melt the glass, whereby a zone of rising glass currents is established in the pool between the downstream end of the batch layer and the downstream end of the furnace, on the upstream side of the zone of rising glass currents injecting gas into the molten glass at a plurality of locations extending transversely across the furnace so as to enhance the rising glass currents, the gas injection in at least one transverse side portion being sustained at a volume rate at least ten percent greater than the rate of gas injection in central portions of the furnace.

4,536,206

MITICIDAL COMPOSITION AND METHOD FOR CONTROLLING SPIDER MITES

Yoshiaki Kubo; Kaoru Takemura, both of Kagoshima, and Shuichiro Kouno, Omiya, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 14, 1983, Ser. No. 541,841

Claims priority, application Japan, Oct. 15, 1982, 57-180961

Int. Cl.³ A01N *25/00*

U.S. Cl. 71—3 11 Claims

1. A miticidal composition consisting essentially of a water-soluble acidic high molecular weight branched and crosslinked polymer having a plurality of carboxyl groups as active ingredient and an aqueous medium as inert carrier, wherein the concentration of the active ingredient is at most 3000 ppm.

4,536,207

NEMATOCIDALLY ACTIVE CHITIN-PROTEIN COMPLEX

Russell J. McCandliss, Germantown, Md.; Barbara J. Eastwood, Round Hill, Va., and Robert A. Milch, Baltimore, Md., assignors to IGI Biotechnology, Inc., Columbia, Md.

Filed Jul. 26, 1983, Ser. No. 517,312

Int. Cl.³ C07G *7/00*; E05B *65/48, 65/46*

U.S. Cl. 71—88 20 Claims

1. A composition of matter comprising a nematocidally active chitin-protein complex derived from crustacean shell waste material and consisting essentially of a water-insoluble demineralized chitin component complexed with a water-insoluble protein component, said complex being essentially free of low molecular weight peptides, amino acids, and calcium chloride brine formed by acid hydrolysis of such waste material, said complex characterized by:

(a) a Lowry protein content of at least about 50% by weight, an ash content of not more than about 15% by weight, and a moisture content of less than about 10% by weight, based on the total composition;
(b) having solubility properties similar to those of chitin in being insoluble in neutral dilute acid solutions but solubilized with significant decomposition of the protein component in concentrated mineral salts;
(c) having an IR spectrum similar to that of chitin but with a characteristic extra adsorption band at 1738 cm^{-1};
(d) the water-insoluble, demineralized chitin component having an acetyl content substantially identical to that of chitin as shown by a characteristic infrared spectrum adsorption band at 1550 cm^{-1}, but which is substantially free of carbonates and contains not more than about 15% of the ash content of chitin;
(e) the water-insoluble protein component having an amino acid composition substantially identical to that of untreated crustacean shell waste material, a molecular weight primarily in the range of 10 to 50 kdal as determined by sodium dodecyl sulfate gel electrophoresis, and being essentially insoluble in common protein solvents; and
(f) said complex being in the form of dry particles having a diameter of less than about 0.5 mm.

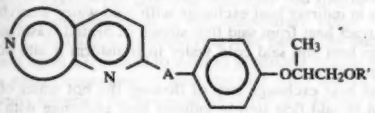
4,536,208

CERTAIN NAPHTHYRIDINE DIETHER COMPOUNDS AND THEIR HERBICIDAL USE

James A. Turner, Pittsburg, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 395,415, Jul. 6, 1982, Pat. No. 4,472,193. This application Sep. 17, 1984, Ser. No. 651,555
Int. Cl.³ C07D *487/04;* A01N *43/40*
U.S. Cl. 71—94 17 Claims

1. A compound of the formula

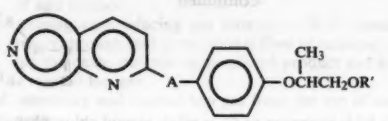


(II)

wherein

represents a fused six-membered nitrogen-containing aromatic ring which forms a 1,5-, 1,6-, 1,7- or 1,8- naphthyridinyl moiety with the adjoining pyridine ring, said naphthyridinyl moiety optionally being substituted at the 6-position of the naphthyridinyl moiety with a chloro, iodo, CF_3, bromo, or fluoro atom with the proviso that said substitution occurs only when the 6-position of said naphthyridinyl moiety is occupied by a carbon atom;
A represents O or S; and
R' represents H or C_1–C_4alkyl.

14. A method of controlling undesired plant growth which comprises applying to the locus of said plants a herbicidally effective amount of an active compound of the formula



(II)

wherein

represents a fused six-membered nitrogen-containing aromatic ring which forms a 1,5-, 1,6-, 1,7- or 1,8-naphthyridinyl moiety with the adjoining pyridine ring, said naphthyridinyl moiety optionally being substituted at the 6-position of the naphthyridinyl moiety with a chloro, iodo, CF_3, bromo, or fluoro atom with the proviso that said substitution occurs only when the 6-position of said naphthyridinyl moiety is occupied by a carbon atom;
A represents O or S; and
R' represents H or C_1–C_4alkyl.

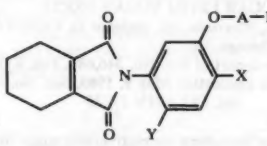
4,536,209

N-(3-SUBSTITUTED OXYPHENYL)TETRAHYDROPHTHALIMIDES AND HERBICIDAL COMPOSITION

Tetsuo Jikihara, Kawasaki; Masatsugu Oda, Yokohama; Bunji Natsume, Yokohama; Hisao Watanabe, Yokohama, and Seiichi Suzuki, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

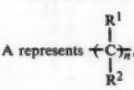
Filed Oct. 5, 1981, Ser. No. 308,825
Claims priority, application Japan, Oct. 7, 1980, 55-140076; Oct. 9, 1980, 55-141778; Oct. 9, 1980, 55-141776
Int. Cl.³ C07D *209/48;* A01N *43/38*
U.S. Cl. 71—96 12 Claims

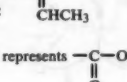
1. A method of controlling weeds in the cultivation of a crop plant by applying a herbicidally effective amount of an N-(3-substituted oxyphenyl)-3,4,5,6-tetrahydrophthalimide of the formula:

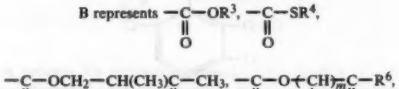


(I)

wherein X and Y each represent hydrogen or halogen;

A represents  , or $-CH_2CH{=}CH-$;

B represents  ,



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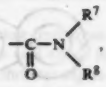


or —CN; R^1 is hydrogen or C_{1-10} alkyl, phenyl chlorophenyl, bromophenyl, dichlorophenyl, methylchlorophenyl, methylphenyl or nitrophenyl; R^2 is hydrogen or C_{1-4} alkyl; R^3 is hydrogen or a C_{1-12} straight or branched alkyl, C_{2-5} alkenyl, C_{2-5} alkynyl, C_{1-5} haloalkyl, C_{3-4} haloalkenyl, C_{2-4} cyanoalkyl, C_{2-4} hydroxyalkyl, C_{3-6} alkoxyalkyl, C_{5-8} alkoxyalkoxyalkyl, C_{7-10} alkoxyalkoxyalkoxyalkyl, C_{3-8} alkylthioalkyl, C_{4-8} cycloalkyl, C_{7-9} aralkyl, chlorobenzyl, bromobenzyl, phenyl, γ-butyrolactone optionally substituted by methyl, an alkali metal cation, an alkaline earth metal cation, ammonium cation, or an ammonium cation having 1 to 4 alkyl substituents, wherein the total carbon atom content of the ammonium cation is 1 to 9 carbon atoms; R^4 is C_{1-12} alkyl, C_{3-6} alkoxycarbonylalkyl or benzyl; R^5 is hydrogen or methyl; R^6 is methyl or phenyl; R^7 and R^8 can be the same or different and each is hydrogen, C_{1-10} branched or straight chain alkyl, C_{2-5} alkenyl, C_{2-5} alkynyl, C_{2-6} haloalkyl, C_{2-6} hydroxyalkyl, alkoxyalkyl, aralkyl, phenyl, chlorophenyl, bromophenyl, methylphenyl, methoxyphenyl, pyrimidine, thiazole, pyridine, C_{1-6} alkoxy, C_{2-4} alkenyloxy, amino, methylamino, phenylamino, dimethylamino, C_{1-4} alkanesulfonyl, benzenesulfonyl, toluenesulfonyl, chlorobenzenesulfonyl, methoxybenzenesulfonyl or cyclohexyl; and

wherein R^7 and R^8 together form a piperidine, or optionally together with an oxygen form a morpholine, isoxazolidine, or tetrahydroisoxazine ring; and m and n each represent an integer of 1 to 3.

4,536,210

METHOD OF INCREASING THE RECOVERABLE SUGAR FROM SUGAR BEETS

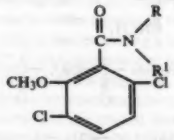
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 346,687, Feb. 8, 1982, abandoned. This application May 9, 1983, Ser. No. 492,521

Int. Cl.³ A01N *37/20*

U.S. Cl. 71—118 **5 Claims**

1. A method for increasing the recoverable sugar from sugar beets which comprises contacting the sugar beet plants during the period of from about two to about ten weeks before harvest with an effective amount of a sugar ripener having the following structural formula:



wherein R is selected from the group consisting of hydrogen and lower alkyl and R^1 is lower alkyl.

4,536,211

WASTE GAS CIRCULATION METHOD AND SYSTEM FOR SINTERING APPARATUS

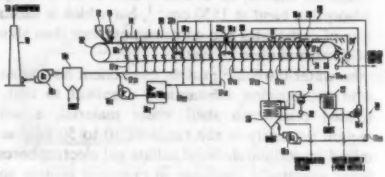
Takashi Futakuchi, Nishinomiya; Kiyofumi Nakamura, Kitakyushu; Yoshimasa Sato, Niihama; Toshio Tsukuda, Niihama, and Hiroyuki Shiraishi, Niihama, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Sumitomo Heavy Industries Ltd., Tokyo, both of, Japan

Filed May 17, 1983, Ser. No. 495,373

Claims priority, application Japan, May 18, 1982, 57-82421

Int. Cl.³ F27B *9/12*

U.S. Cl. 75—5 **9 Claims**



1. A method for recovering heat from the hot waste gas from a conveyor-type sintering apparatus in which a charge mixture of ore, solid fuel and flux is sintered, said sintering apparatus comprising a sintering zone through which said mixture is moved and is sintered therein and a cooling zone located downstream from said sintering zone and through which said mixture is moved and is cooled therein, said sintering zone having first, second and third groups of wind boxes for withdrawing heated waste gas from said sintering zone, said first, second and third groups of wind boxes being arranged in series in said sintering zone and being located, respectively, at the front stage, intermediate stage and final stage of said sintering zone, said cooling zone having fourth, fifth and sixth groups of wind boxes for withdrawing heated waste gas from said cooling zone, said fourth, fifth and sixth groups of wind boxes being arranged in series in said cooling zone and being located, respectively, at the front stage, intermediate stage and final stage of said cooling zone, the steps comprising:

a first heat exchange step of flowing a first stream of the heated waste gas from said fifth and sixth groups of wind boxes in indirect heat exchange with cold water whereby to extract heat from said first stream of heated waste gas and to heat and said cold water to transform it into hot water; and

a second heat exchange step of flowing the hot water obtained in said first step in indirect heat exchange with a second stream of heated waste gas from said third and fourth groups of wind boxes whereby to extract heat from said second stream of heated waste gas and to heat said hot water to transform it into steam, said second stream of heated waste gas containing sulfur oxides and being maintained, in said second step, at a relatively high temperature effective to prevent condensation of said sulfur oxides in the form of droplets of sulfuric acid.

4,536,212

PRODUCTION OF A PURIFIED ALUMINUM MONOCHLORIDE FROM ALUMINA, BAUXITES AND CLAYS AND THE SUBSEQUENT PRODUCTION OF ALUMINUM METAL

David Weston, 34 Parkwood Ave., Toronto, Canada M4V 2X1

Continuation-in-part of Ser. No. 426,971, Sep. 29, 1982, Pat. No. 4,437,887. This application Aug. 17, 1983, Ser. No. 523,873

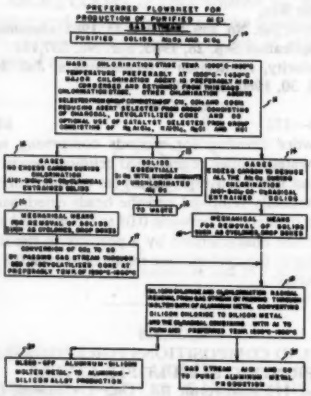
The portion of the term of this patent subsequent to Mar. 20, 2001, has been disclaimed.

Int. Cl.³ C22B *21/02*

U.S. Cl. 75—68 B **12 Claims**

1. The process steps for the production of aluminum metal

from the group of materials consisting of alumina, bauxites, bauxitic clays, clays and mixtures thereof and said materials containing at least Al_2O_3 minerals in the group consisting of $Al_2O_3xH_2O$ and $Al_2O_32SiO_2\ 2H_2O$ and said Al_2O_3 minerals containing chemically combined H_2O comprising: subjecting the said materials to calcination in the temperature range of about 625° C. to 1500° C. to produce a calcined product substantially free of said chemically combined H_2O; subsequently subjecting the said calcined product to at least a mass chlorination stage in the presence of chlorination agent containing at least Cl_2 radical and selected from the group consisting of Cl_2, $COCl_2$, CCl_4 and $AlCl_3$ and reducing agent selected from the group consisting of C and CO and in the temperature range of about 1200° C. to 1600° C. to produce a gas stream wherein the said Al_2O_3 has been coverted to gaseous AlCl and said gas



stream contains said AlCl, and at least CO_2 and Cl_2 radical; subsequently passing the said gas stream through at least one bed selected from the group consisting of charcoal and devolatilized coke and in the temperature range of about 1200° C. to 1600° C. to convert said CO_2 to CO to produce a first modified gas stream containing at least said AlCl and said CO; subsequently passing the said first modified gas stream through molten aluminum metal in the temperature range of about 1200° C. to 1600° C. to convert at least part of the said chlorination agent Cl_2 radical to AlCl to produce a second modified gas stream containing at least the said AlCl and CO; subsequently lowering the temperature of the said second modified gas stream to within the temperature range of about 670° C. to 1050° C. to produce molten aluminum metal and a third modified gas stream containing at least $AlCl_3$ and said CO.

4,536,213

REFORMING OF HIGHER HYDROCARBONS FOR METAL OXIDE REDUCTION

Charles W. Sanzenbacher, Charlotte, N.C., assignor to Mildrex International, B.V., Zurich, Switzerland

Filed Sep. 10, 1984, Ser. No. 648,564
Int. Cl.³ C21B *13/02*
U.S. Cl. 75—91 **6 Claims**

1. A process for reducing metallic oxide to metallized material utilizing process fuel gas containing higher hydrocarbons of pentane or higher, comprising:

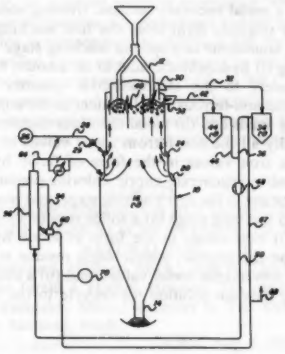
a. establishing a gravitational flow of particulate metallic oxide material through a generally vertical shaft furnace by charging such materials to the upper portion of said shaft furnace to establish a particulate burden therein having an upper stock line, and removing metallized product from the bottom of said furnace;

b. introducing a reducing gas mixture to said gravitational flow of material in said shaft furnace intermediate the ends of said furnace;

c. causing said reducing gas mixture to flow countercurrently through said gravitational flow of material, reducing the oxide material to metallized product and forming a reacted top gas;

d. removing said reacted top gas from the top of said furnace;

e. introducing process fuel gas containing higher hydrocarbons of pentane or higher to said furnace at an elevation above that of the reducing gas introduction;



f. causing said process fuel gas containing said higher hydrocarbons to flow upwardly through said burden;

g. removing a substantial portion of said process gas with said higher hydrocarbons at an elevation above the stock line but lower than the elevation at which reacted top gas is removed;

h. cleaning and scrubbing said top gas and said process gas;

i. combining said cleaned and scrubbed top gas and process gas and passing the mixture through a stoichiometric reformer to form a reformed gas; and

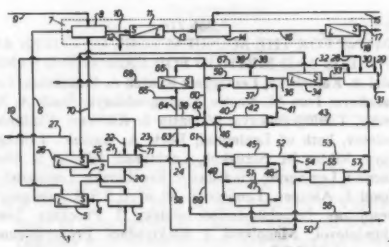
j. introducing said reformed gas to said shaft furnace through the bustle gas inlet.

4,536,214

METAL SULPHIDE EXTRACTION

Leonard R. Ochs; Archibald W. Fletcher, both of Tucson, Ariz.; Harald Weber, Isernhagen, Fed. Rep. of Germany, and David Naden, Stockton-on-Tees, England, assignors to Duval Corporation, Tucson, Ariz.

Filed Jul. 7, 1983, Ser. No. 511,464
Int. Cl.³ C01G *3/05, 9/04;* **C22B** *15/08, 15/12*
U.S. Cl. 75—101 R **23 Claims**



1. A process for recovering metal values from a zinc-containing complex sulphide material, which sulphide material further contains copper in sulphide form, comprising leaching the material in a first leaching stage under non-oxidative condi-

tions with a controlled amount of an aqueous chloride lixiviant solution containing cupric chloride in an amount which is selected so as to solubilize at least a part of the zinc in the material and to precipitate a quantity of cupric sulphide substantially equivalent on a molar basis to the zinc leached from the material, the lixiviant solution further containing sufficient of a source of chloride ions other than cupric chloride to ensure solubilization of metal chlorides present, recovering from the first leaching stage a zinc chloride-containing leach liquor, which further contains an amount of copper ions equivalent to the copper content of the zinc-containing complex sulphide material, recovering metal values from said leach liquor in a metal recovery section, treating solids containing copper in sulphide form from the first leaching stage under oxidizing conditions in a second leaching stage with a liquor containing (i) hydrochloric acid in an amount corresponding approximately to the stoichiometric quantity required for leaching the non-ferrous metal content of the copper sulphide-containing solids and (ii) metal chlorides thereby to solubilize substantially all the non-ferrous metal values in the solids, to precipitate iron values in the form of ferric hydroxide and jarosite and to regenerate cupric chloride-containing lixiviant solution for use in the first leaching stage, and recovering from the second leaching stage (a) a solids residue consisting essentially of (i) iron values in the form of ferric hydroxide and jarosite and (ii) sulphur, which solids residue is substantially free from non-ferrous metal values, and (b) a cupric chloride-containing lixiviant solution for recycle to the first leaching stage.

4,536,215
BORON ADDITION TO ALLOYS

Brian C. Coad, San Francisco, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 10, 1984, Ser. No. 680,106
Int. Cl.[3] C22B *23/00*
U.S. Cl. 75—129 **4 Claims**

1. A process for addition of boron to an iron or nickel base alloy, said process comprising:

(a) forming a melt of said alloy and a reactive metal selected from the group consisting of aluminum, titanium and zirconium,

(b) adding a charge of boric oxide to said melt to form a reactive mixture,

(c) maintaining said reactive mixture in the molten state thereby reacting at least a portion of said boric oxide with said reactive metal to convert at least a portion of said first charge of boric oxide to boron which dissolves in the resulting melt, and to convert at least a portion of said reactive metal to the reactive metal oxide essentially all of which oxide forms a separate slag phase,

(d) removing said slag phase from said resulting melt and,

(e) atomizing said resulting first melt into droplets and,

(f) cooling the atomized droplets to form a powder.

4,536,216
CEMENT FOR THE MANUFACTURE OF CORES AND MOULDS AND METHOD FOR PREPARING SAME

Nikolai A. Kaluzhsky, Leningrad; Khoren A. Badaliants, Leningradskaya; Ivan M. Kostin, Leningradskaya; Isaak A. Zatulovsky, Leningradskaya; Valentin I. Korneev; Vladimir V. Andreev, both of Leningrad; Boris A. Kuzmin, Leningradskaya; Viktor M. Sizyakov, Leningrad; Nikolai S. Shmorgunenko, Leningrad; Vladislav A. Krochevsky, Leningrad, and Alexei I. Alexeev, Leningrad, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievoi, Magnievoi I Elektrodnoi Promyshlennosti, Leningrad, U.S.S.R.

Filed May 5, 1983, Ser. No. 491,979
Int. Cl.[3] B28B *7/34*
U.S. Cl. 106—38.3 **4 Claims**

1. A cement for the manufacture of cores and moulds containing chemically combined oxides, with the following percent by weight: CaO, 50 to 60; Al_2O_3, 28 to 37; Fe_2O_3, 0.01 to 1; SiO_2, 0.1 to 8; Na_2O, 0.1 to 1; K_2O, 0.1 to 0.5; H_2O, 3 to 12; and having the following grain-size distribution: 85 to 99% by weight of a fraction with a particle size below 80 μm and 1 to 15% by weight of a fraction with a particle size of from 80 to 200 μm.

4,536,217
ABSORBING COVER FOR WOUNDS AND THE METHOD FOR MANUFACTURING THEREOF

Fritz Loth; Horst Dautzenberg, both of Tetlow, German Democratic Rep.; Jirí Stamberg; Jan Peska, both of Prague, Czechoslovakia; Dieter Bertram, and Herbert Lettau, both of Leipzig, German Democratic Rep., assignors to Ceskoslovenska akademie ved of Praha, Prague, Czechoslovakia and Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.

Continuation of Ser. No. 286,250, Jul. 23, 1981, abandoned. This application Sep. 28, 1983, Ser. No. 537,151
Claims priority, application Czechoslovakia, Jul. 30, 1980, 5332-80; Jul. 30, 1980, 5330-80
Int. Cl.[3] C08C *1/24*
U.S. Cl. 106—122 **13 Claims**

1. A powder dressing for wounds comprising spherical particles of water swollen regenerated cellulose beads wherein the water had first been replaced by an organic solvent, the solvent sequentially removed and the beads dried, said particles having a diameter of between 0.05 to 0.5 mm and a macroporous structure characterized by a porosity in the dry state corresponding to the cyclohexane regain of at least 0.2 ml/g of the dry material.

4,536,218
PROCESS AND COMPOSITIONS FOR LITHOGRAPHIC PRINTING IN MULTIPLE LAYERS

Eli A. Ganho, 112 Snidercroft Rd., Unit 8, Concord, Ontario, Canada L4K 2K1

Filed Feb. 8, 1984, Ser. No. 578,556
Claims priority, application Canada, Feb. 9, 1983, 421252
Int. Cl.[3] C04B *31/18*; C08K *3/08*; C09C *1/62*; C09D *5/10*
U.S. Cl. 106—290 **4 Claims**

1. A varnish composition suitable for lithographic application to a substrate to cover indicia printed thereon preparatory to hiding said indicia with an abrasively removable hiding coat, said composition including the following ingredients in the following approximate weight range:

Components	% Range
Magie oil (solvent)	30–35
Phenolic modified rosin ester	16–20
Hydrocarbon resin	13–17
Linseed-[isophtholic] isophthalic alkyd	10–13
Hydrocarbon plasticizer	7–10
Montan wax	3–6
Calcium perborate	1.5–3
Maganese octoate	1.5–2
Cobalt octoate	0.5–1
Gelling agent	0.5–0.7
Chinawood oil	0.3–0.5

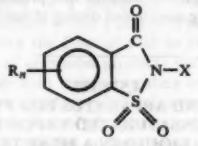
4,536,219
THERMOGRAPHIC RECORDING COMPOSITIONS

Claude R. Riou, Veyrier du lac, and Jean F. Fayard, St. Julien en Genevois, both of France, assignors to Societe Anonyme: Aussedat-Rey, France

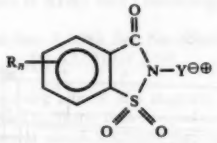
Filed Jul. 13, 1983, Ser. No. 513,304
Claims priority, application France, Jul. 16, 1982, 82 12845
Int. Cl.[3] C09D *11/00*
U.S. Cl. 106—21 **18 Claims**

10. A method for providing a thermographic color change, said method comprising the step of heating a thermographic

composition to a temperature sufficient to cause a color forming reaction between a color former and color developer therein, wherein said color developer comprises a compound to the formula:



wherein n is an integer of from 0 to 4; each R independently represents H, alkyl, NO_2, halogen, aryl, NH_2, OH, COOH, SO_3H, NR_1R_2, $COOR_3$, or OR_4; wherein R_1, R_2, R_3 and R_4 are alkyl or aryl; x represents H, a group possessing a labile H capable of forming a stable anion by loss of proton H^+, and their salts of the formula



in which Y represents X minus H and M^+ represents a metal cation.

4,536,220

FLUORAN DERIVATIVES AS NEW COMPOUNDS AND RECORDING SYSTEM UTILIZING THE SAME AS COLORLESS CHROMOGENIC MATERIAL

Mitsuru Kondo, Hyogo; Hiroshi Iwasaki, Kawanishi; Haruo Omura, Motomachi, and Nobuo Kanda, Osaka, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

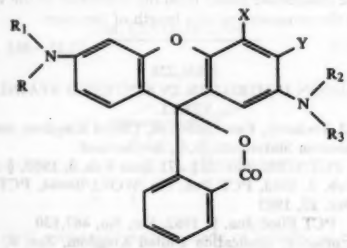
Filed Dec. 19, 1983, Ser. No. 562,738

Claims priority, application Japan, Dec. 27, 1982, 57-233077; Jan. 20, 1983, 58-8544; Aug. 10, 1983, 58-147057

Int. Cl.³ C09D *11/00*

U.S. Cl. 106—21 **8 Claims**

1. A fluoran derivative, as a new article of a compound, having the following formula:



wherein R is cyclopentyl, cycloheptyl, cyclohexylmethyl or cyclohexyl substituted by at least one alkyl and having 7 to 10 carbon atoms; R_1 is an alkyl having 1 to 8 carbon atoms, R_2 is hydrogen, R_3 is a phenyl which may be substituted by at least one substituent selected from the group consisting of alkyls having 1 to 4 carbon atoms, halogen atoms and halogen substituted methyls, X is hydrogen and Y is hydrogen or an alkyl having 1 to 4 carbon atoms.

4,536,221

PROCESS FOR PREPARING LACTULOSE FROM LACTOSE, IN THE FORM OF A SYRUP OR A CRYSTALLINE PRODUCT

Renato Carobbi, Pistoia; Sandro Miletti, Florence, and Vittorio Franci, San Piero a Sieve, all of Italy, assignors to SIRAC Spa, Milan, Italy

Filed Aug. 1, 1983, Ser. No. 518,846

Claims priority, application Italy, Dec. 17, 1982, 24814 A/82

Int. Cl.³ C13K *5/00*

U.S. Cl. 127—30 **8 Claims**

1. A process for preparing lactulose from lactose, comprising adding to an aqueous solution containing 60%–70% of lactose, a basic magnesium compound and sodium hydrosulphite in amounts corresponding to 0.05%–0.2% by weight of each of the added compounds with respect to the lactose and heating the solution to a temperature of from 90° C. to 100° C. to effect isomerization of the lactose to lactulose in the presence of the magnesium compound and the sodium hydrosulfite to produce a reaction solution containing the lactulose.

4,536,222

METHOD FOR REMOVING OR RETARDING PARAFFIN BUILDUP ON SURFACES IN CONTACT WITH NATURAL GAS

William J. Settineri, Midland, Mich.; John G. Charles, Westerville, Ohio; Jerald J. Hinkel, Houston, Tex., and Bradley P. Malone, Kalkaska, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 518,896, Aug. 1, 1983, Pat. No. 4,455,175. This application May 11, 1984, Ser. No. 609,383

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.³ B08B *7/04*; E21B *37/06*

U.S. Cl. 134—5 **13 Claims**

1. A method for retarding deposition of paraffins on the surfaces of equipment in contact with natural gas containing such paraffins which comprises contacting the surface with a sulfur trioxide-containing fluid and thereafter rinsing the surface.

4,536,223

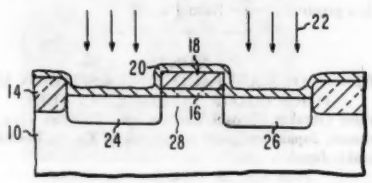
METHOD OF LOWERING CONTACT RESISTANCE OF IMPLANTED CONTACT REGIONS

Thomas J. Faith, Jr., Lawrenceville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 29, 1984, Ser. No. 594,825

Int. Cl.³ H01L *21/265*

U.S. Cl. 148—1.5 **6 Claims**



1. A method of making a low resistance contact to a body of semiconductor material which includes the step of

removing any oxide from at least a portion of a surface of a body of semiconductor material while said body is in a chamber from which substantially all oxygen is removed,

immediately depositing on said surface without exposing the surface to oxygen a layer of aluminum which is substantially free of oxygen and which is electrically innocuous in the material of the semiconductor body while said body is maintained in said oxygen free chamber,

then implanting into the semiconductor body through said layer ions of a desired conductivity type to form in said body a region of relatively high conductivity, and then annealing said body to activate said ions.

4,536,224

SALT BATH FOR THE CURRENTLESS PRODUCTION OF WEAR RESISTANT BORIDE LAYERS

Hans-Hermann Beyer, Kahl; Ulrich Baudis, Hanau; Peter Biberbach, Rodenbach, and Wolfgang Weber, Karlstein, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,302

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1983, 3326863

Int. Cl.³ C23C 9/40

U.S. Cl. 148—6.11 17 Claims

1. A salt bath containing alkali metal halide, alkaline earth metal halide or a mixture of alkali metal and alkaline earth metal halide and suitable for the currentless production of a wear resistant boride coating of Fe_2B on metallic workpieces, said bath also containing boron monofluoride in a gaseous state or a compound which under the conditions of the operation of the bath forms boron monofluoride intermediately by a reaction of $(BOF)_3$ with a boriding agent.

4,536,225

SURFACE TREATMENT OF METAL

Richard A. Cayless, Wandsworth, and Prem S. Thukral, Sunbury-on-Thames, both of England, assignors to The British Petroleum Company p.l.c., London, England

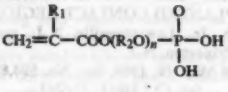
Filed Aug. 1, 1984, Ser. No. 636,599

Claims priority, application United Kingdom, Aug. 6, 1983, 8321253

Int. Cl.³ C23F 7/10

U.S. Cl. 148—6.15 R 16 Claims

1. A method of inhibiting corrosion of a metal surface comprising applying to the metal surface an organic solvent in which is dissolved a phosphate monoester of a hydroxyalkyl acrylate or alkylacrylate which phosphate monoester has the general formula;



where

R_1 is hydrogen, a methyl group or an ethyl group

R_2 is an alkyl group having from 2 to 10 carbon atoms and n is a positive integer from 1 to 20.

4,536,226

METHOD OF MANUFACTURING A SHADOW MASK FOR A COLOR CATHODE RAY TUBE

Yasuhisa Ohtake; Hiroshi Tanaka, and Koichiro Oka, all of Saitama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 25, 1984, Ser. No. 603,867

Claims priority, application Japan, Apr. 27, 1983, 58-72935

Int. Cl.³ C21D 8/04; C22C 38/08

U.S. Cl. 148—12 C 11 Claims

1. A method of manufacturing a shadow mask from a sheet having a polycrystalline structure of an alloy comprising iron and nickel, the sheet having a yield strength, said method comprising the steps of:

perforating the sheet;

annealing the perforated sheet at a first predetermined temperature effective to reduce the yield strength, the first predetermined temperature being between a recrystallization temperature and a melting temperature of the alloy; and

pressing the annealed sheet while maintaining the sheet at a second predetermined temperature effective to further reduce the yield strength, the second predetermined temperature being lower than the first predetermined temperature and being maintained during at least part of said step of pressing.

4,536,227

METHOD OF AND APPARATUS FOR PRODUCING A CONTROLLED UNSATURATED VAPOR PRESSURE OF A VOLATILE LIQUID IN A HEAT TREATMENT CHAMBER

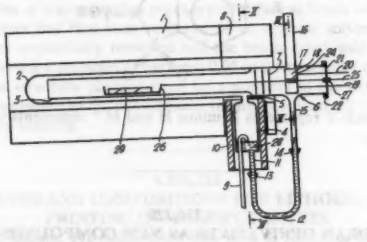
John C. Brice, Copthorne Bank, and Colin R. Brough, Blackburn, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1983, Ser. No. 560,046

Claims priority, application United Kingdom, Dec. 22, 1982, 8236059

Int. Cl.³ C22F 1/02

U.S. Cl. 148—13.1 10 Claims



1. A method of producing a controlled unsaturated vapour pressure of a volatile liquid at a temperature T_l in a heat treatment chamber, said method comprising the steps of passing a stream of a carrier gas through a vapouriser containing the volatile liquid at a temperature T_s, passing the mixture of the carrier gas and the vapour of the volatile liquid through the heat treatment chamber which is at the temperature T_l, leading the mixture of the carrier gas and the vapour of the volatile liquid from the heat treatment chamber to a condenser from which the carrier gas is vented to waste and in which condenser the volatile liquid is condensed at a temperature T_c, that the condensate is recycled through the vapouriser, that $T_l > T_s > T_c$, and that the volatile liquid in a tube through which the condensate passes from the condenser to the vapouriser fills the cross-section of a length of the tube.

4,536,228

CORROSION INHIBITION IN SINTERED STAINLESS STEEL

Timothy J. Treharne, East Grinstead, United Kingdom, assignor to Pemberton Sintermatic S.A., Switzerland

PCT No. PCT/GB82/00172, § 371 Date Feb. 3, 1983, § 102(e) Date Feb. 3, 1983, PCT Pub. No. WO82/04444, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 9, 1982, Ser. No. 467,130

Claims priority, application United Kingdom, Jun. 9, 1982, 8117814

Int. Cl.³ C23F 7/10

U.S. Cl. 148—6.15 R 9 Claims

1. A process for the treatment of a sintered stainless steel element to enhance its corrosion resistance, the element being porous having pores with interior surfaces and for use in an environment in which aqueous acetic acid solution will be passed through the element, said process comprising the steps of:

(a) passing a preliminary flow of an aqueous acetic acid solution through the element in an amount sufficient to at least partially activate the interior surfaces of pores in the elements,
(b) terminating the preliminary flow of acetic acid, then
(c) passing a flow of a phosphate containing solution through the element within a period of time short enough after terminating the flow of acid to prevent excessive accumulation of corrosion products within the pores to generate a corrosion resistant coating on the previously activated interior surfaces of the element, and
(d) terminating the flow of phosphate containing solution,
(e) said corrosion resistant coating being effective to resist corrosion by subsequent flows of aqueous acetic acid solution through the element.

4,536,229
FE-NI-MO MAGNET ALLOYS AND DEVICES

Sangho Jin, Millington, and Thomas H. Tiefel, Piscataway, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 8, 1983, Ser. No. 550,000
Int. Cl.³ H01F *1/04*
U.S. Cl. 148—31.55 **9 Claims**

1. Device comprising a body of a magnetic alloy having a coercive force which is greater than or equal to 40 oersteds and a magnetic squareness which is greater than or equal to 0.6,
said device being characterized in that
said alloy comprises Fe, Ni, and Mo in a combined amount which is greater than or equal to 95 weight percent of said body,
Ni content of said alloy being in the range of 16–30 weight percent of said combined amount,
Mo content of said alloy in the range of from 3–10 weight percent of said combined amount, and
each of the elements Si, Al, Cu, V, Ti, Nb, Zr, Ta, Hf, and W being present in said alloy in an amount which is less than 0.5 weight percent of said combined amount.

4,536,230
ANISOTROPIC PERMANENT MAGNETS

Vaclav Landa, and Zdenek Blazek, both of Prague, Czechoslovakia, assignors to Stani vyzkumny ustav materialu, Prague, Czechoslovakia

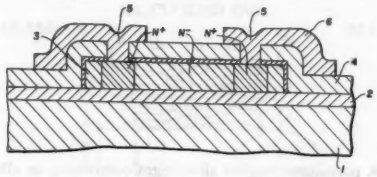
Continuation-in-part of Ser. No. 129,428, Mar. 12, 1980, abandoned. This application Jun. 17, 1981, Ser. No. 274,413
Claims priority, application Czechoslovakia, Mar. 13, 1979, 1661-70
Int. Cl.³ H01F *1/04*
U.S. Cl. 148—31.57 **18 Claims**

1. A rigid permanent magnet made of metallic or ceramic material without a plastic matrix, said magnet having within at least a part thereof an anisotropic magnetic structure, wherein the direction of the axes of easy magnetization have a convergent orientation, said orientation concentrating the magnetic flux in the surface region of the pole of the magnet into a smaller cross-section than that of the magnet, and the orientation lines extending from said pole point toward the pole of opposite polarity the area or the center of which are disposed at the opposite magnet side.

4,536,231
POLYSILICON THIN FILMS OF IMPROVED ELECTRICAL UNIFORMITY

Alan J. Kasten, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 435,221, Oct. 19, 1982, Pat. No. 4,466,179. This application May 22, 1984, Ser. No. 612,877
Int. Cl.³ H01L *21/265, 21/263*
U.S. Cl. 148—33.1 **5 Claims**

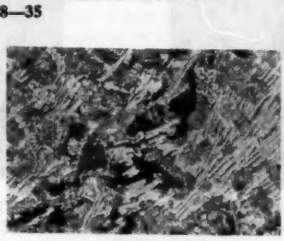


1. A polysilicon thin film semiconductor device precursor of reduced anisotropy, comprising:
a substrate with a polysilicon thin film deposited thereover which film has been scanned a first time by a laser beam in a first direction to produce relatively long, thin crystallites having a long axis oriented generally parallel to the direction of said first scan, and scanned a second time by a laser beam in a direction at a bias to said first direction, whereby the recrystallized crystallites of the polysilicon thin film are caused to grow in the direction of said second scanning.

4,536,232
EROSION AND CORROSION RESISTANT CAST IRON ALLOY CONTAINING CHROMIUM, NICKEL AND MOLYBDENUM

Igor Y. Khandros, Hoboken, and Hugo R. Larson, Mahwah, both of N.J., assignors to Abex Corporation, New York, N.Y.

Filed Nov. 10, 1983, Ser. No. 550,496
Int. Cl.³ C22C *38/42*
U.S. Cl. 148—35 **2 Claims**

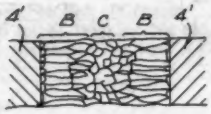


1. A cast iron alloy in percent by weight consisting essentially of about 1.2 to 2 carbon, 1–4 nickel, 1–4 molybdenum, 24–32 chromium, up to 1 copper, and up to about one percent of a microalloying element selected from the group consisting to titanium, zirconium, boron, niobium and rare earth elements, balance substantially iron, characterized by a matrix substantially entirely of tempered martensite balance, if any, austenite, in which matrix is dispersed both primary chromium-rich carbides and ferrite islands but substantially no secondary carbides.

4,536,233
COLUMNAR CRYSTAL PERMANENT MAGNET AND METHOD OF PREPARATION

Itaru Okonogi, and Tatsuya Shimoda, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 330,977, Dec. 15, 1981, abandoned. This application Nov. 30, 1983, Ser. No. 556,751
Claims priority, application Japan, Dec. 16, 1980, 57-177892
Int. Cl.³ H01F *1/02*
U.S. Cl. 148—101 25 Claims



1. A permanent magnet alloy ingot comprising an alloy of samarium (Sm) and cobalt (Co), copper (Cu), iron (Fe) and at least one element (M) selected from the group of elements consisting of zirconium (Zr), titanium (Ti), hafnium (Ha), tantalum (Ta), niobium (Nb) and vanadium (V), formed predominately of Sm_2Co_{17} crystals and having at least about 50 volume percent columnar crystals in the macrostructure of the alloy.

4,536,234
METHOD FOR REFINING MICROSTRUCTURES OF BLENDED ELEMENTAL POWDER METALLURGY TITANIUM ARTICLES

Daniel Eylon, Dayton, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 5, 1984, Ser. No. 617,447
Int. Cl.³ B22F *3/00*
U.S. Cl. 148—133 7 Claims

1. A method for improving the microstructure of an article made by powder metallurgy of blended elemental powder equivalent in bulk chemistry to a titanium alloy which comprises, in combination, the steps of:

a. beta-solution heat treating said article at a temperature approximately equal to the beta-transus temperature of the equivalent alloy;

b. cooling said article at a rate in excess of air cooling to room temperature;

c. annealing said article at a temperature in the approximate range of 10 to 20% below said beta-transus temperature for about 4 to 36 hours; and,

d. air cooling said article to room temperature.

4,536,235
COMBUSTION INHIBITORS ON A BASE OF OXYGENATED POLYURETHANE ELASTOMER WHICH CONTAINS FIBERS FOR THE DOUBLE BASE PROPELLANT

André Lelu; Bruno Gonthier, both of Saint-Medard en Jalles; Jean Grignon, Pessac, and Jean-Michel Tauzia, Blanquefort, all of France, assignors to Societe Nationale Des Poudres et Explosifs, Paris, France

Filed Dec. 20, 1983, Ser. No. 563,355
Claims priority, application France, Dec. 28, 1982, 82 21880
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 9 Claims

1. A gasifiable inhibitor for a double base propellant which comprises a polyurethane elastomer having in chemically combined form a product which is an aliphatic polyester polyol or an aliphatic polyether polyol, or a mixture thereof which product contains 2–6 hydroxyl groups per molecule, an aliphatic polyisocyanate, at least one organic gasifiable charge and an aliphatic plasticizer, and 0.1–10 parts by weight of mineral fibers or thermostable organic fibers of length between 0.1 mm and 15 mm per 100 parts inhibitor.

4,536,236
SELECTING HYDROXY-TERMINATED POLYBUTADIENE FOR HIGH STRAIN PROPELLANTS

Lawrence W. Haas, Sandy, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 6, 1983, Ser. No. 482,667
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.92 4 Claims

1. In selection of hydroxy-terminated polybutadiene from commercial lots thereof for manufacture of propellants for rocket motors with specified physical characterisitics wherein said manufacture includes crosslinking said hydroxy-terminated polybutadiene with an isocyanate crosslinking agent reactive therewith and said hydroxy-terminated polybutadiene is made with a catalyst such as hydrogen peroxide, an improved quality control procedure adapted to distinguish between hydroxy-terminated polybutadiene in commercial lots thereof that are otherwise like appearing, but sufficiently chemically different to yield propellants of diverse strain characteristics, said improved quality control procedure comprising:

selecting samples of said hydroxy-terminated polybutadiene from each of said commercial lots prior to manufacture of propellants therewith, said samples being of sufficient size to perform an NMR analysis on each;

performing said NMR analysis on each of said samples to determine whether there is more or less than about 3% of combined cis and trans epoxy groups based on the total of cis-, trans and vinyl-hydroxy groups and cis- and trans-epoxy groups in each of said samples;

using only hydroxy-terminated polybutadiene having less than about 3% of combined cis and trans epoxy for manufacture of high strain propellants.

4,536,237
ALUMINOTHERMIC REDUCTION REACTION MIXTURE

Robert H. Kachik, Washington Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1984, Ser. No. 572,110
Int. Cl.³ C06B *35/00*
U.S. Cl. 149—37 6 Claims

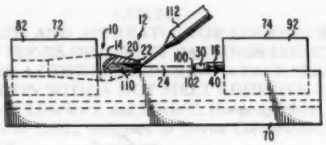
1. An aluminothermic reduction reaction mixture, which produces only a slag phase, consisting essentially of a particulate admixture of metallic aluminum, manganese dioxide and alumina having an aluminum to manganese dioxide ratio of approximately 0.21 and an alumina content of from 15 to 30 weight percent.

4,536,238

METHOD AND APPARATUS FOR ALIGNING A CHUCK FOR HOLDING AN INFORMATION CONTAINING DISC STYLUS

William A. Dischert, Springfield, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 29, 1984, Ser. No. 584,592
Int. Cl.[3] B25B *11/02*
U.S. Cl. 156—64 9 Claims



1. A chuck for holding a stylus comprising:

(a) a body having a shank associated therewith, said shank being adaptable to a machine tool for effecting movement of said body with respect to a datam;

(b) stylus holding means for holding said stylus in alignment with said datam, said stylus holding means having a gripping end for gripping and holding said stylus and a base end for attaching to said body at an end opposite said shank;

(c) filler means rigidly attaching said base end of said stylus holding means to said end of said body opposite said shank.

7. A method of assembling a stylus holding tube to a chuck body wherein said stylus holding tube includes an elongated tube having a first end for gripping a stylus and a second end opposite thereto and wherein said chuck body includes a shank formed with respect to an axis of rotation and a hole formed in said chuck body opposite said shank, comprising the steps of:

(a) aligning said stylus holding tube with respect to said axis of rotation of said chuck body;

(b) inserting said second end of said elongated tube into said hole of said chuck body while maintaining said alignment;

(c) inserting a matrix material into said hole of said chuck body; and

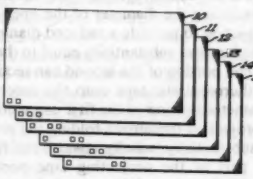
(d) causing said matrix material to flow around and to contact a portion of both of said chuck body and said second end of said stylus holding tube.

4,536,239

MULTI-LAYER CIRCUIT BOARD INSPECTION SYSTEM

Robert F. Benson, San Jose, Calif., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Jul. 18, 1983, Ser. No. 514,624
Int. Cl.[3] G01B *15/00*
U.S. Cl. 156—64 8 Claims



1. An inspection method for use in the fabrication of circuit boards of more than two, precisely registered layers comprising the steps of:

forming at least two targets on each layer to be precisely registered, each target corresponding in position to a target of at least one other layer and the targets of each layer defining a pattern that is unique to that layer;

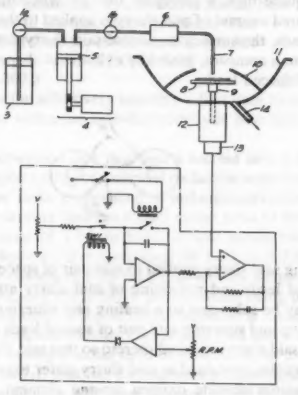
viewing the registration of each target of a layer relative to a test target pattern via radiography techniques.

4,536,240

METHOD OF FORMING THIN OPTICAL MEMBRANES

Ray Wian, Studio City, Calif., assignor to Advanced Semiconductor Products, Inc., Santa Cruz, Calif.

Division of Ser. No. 326,489, Dec. 2, 1981, Pat. No. 4,378,953.
This application Feb. 22, 1983, Ser. No. 468,468
Int. Cl.[3] B29D *7/02*
U.S. Cl. 156—74 33 Claims



1. A method for reliably and reproducibly making an optical membrane capable of being edge-supported, and capable of being removed, substantially intact, from the rotatable surface on which said membrane is formed, and having a predetermined thickness in the range of about 0.5 about 10 micrometers, with a precision of plus or minus about 2%, edge-to-edge variations in said thickness of less than about 2% over a distance of at least about 2.5 centimeters, and a capacity to transmit an average of at least about 91% of incident light with less than about 2% combined absorption and diffraction losses of said incident light over a span of wavelengths of incident light in the range of about 260 to about 1,000 nanometers, said method comprising dispensing a polymer/solvent mixture onto a rotatable supporting surface; spinning said rotatable surface under conditions sufficient to form said membrane from said polymer, said conditions being selected from the following: the viscosity of said polymer/solvent mixture, the rate of rotational acceleration of said rotatable supporting surface, and the final speed of rotation of said surface; and removing said optical membrane, after formation, from said rotatable surface.

4,536,241

METHOD OF MAKING A TITANIUM DIOXIDE OXYGEN SENSOR ELEMENT WITH FAST TRANSIENT RESPONSE

Eleftherios M. Logothetis, Birmingham, and William J. Kaiser, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 27, 1984, Ser. No. 604,662
Int. Cl.[3] B05D *5/12*; G01N *27/12*
U.S. Cl. 156—89 5 Claims

1. A method of making a titanium dioxide element which can be used as an oxygen sensing element, which method comprises the steps of:

selecting at least a pair of electrically conductive leads, said leads being formed of a material which is resistant to thermal degradation at temperatures normally found in

exhaust gases from operation of an internal combustion engine;

placing said pair of leads in a position generally close to one another with a slurry bridgeable space therebetween;

applying to said pair of spaced leads a titanium dioxide containing slurry having the following characteristics: said slurry being formed on a volume basis of 10–50% titanium dioxide, 5–15% of an organic heat decomposable binder, and 85–35% of an organic solvent, and said titanium dioxide in said slurry consisting of particles of substantially rutile phase titanium dioxide having a size range from 0.5–10 micrometers and a surface area of 0.1–3 square meters per gram (m^2/g), whereby when a measured amount of said slurry is applied to the pair of spaced leads, the surface tension of said slurry draws said slurry into a compact, generally cylindrical shape about the pair of spaced leads;

drying said slurry applied to said pair of spaced leads so that said leads and remaining of said slurry attached thereto may be subjected to a heating and sintering operation;

heating and sintering said pair of spaced leads and remaining of said slurry attached thereto so that said titanium dioxide particles contained in said slurry sinter together to form a titanium dioxide oxygen sensing element bridging said bridgeable space between said pair of spaced leads, said titanium dioxide sensing elements having a thickness in a range of 20–200 micrometers and a density in a range of 60–80% of the theoretical value of density of titanium dioxide which is 4.26 grams per cubic centimeter, whereby said titanium dioxide oxygen sensing element is characterized as a fast responding element in sensing ambient changes from oxygen-rich to oxygen-lean conditions and vice-versa.

4,536,242

METHOD AND APPARATUS FOR RETREADING VEHICLE TIRES

Ninneh Gripenholt, Lidköping; Benny Berggren, Vällingby, and Göran Böling, Täby, all of Sweden, assignors to Q & Q Retreading System AB, Lipkoping, Sweden

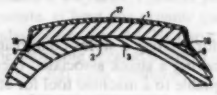
Filed May 9, 1983, Ser. No. 492,734

Claims priority, application Sweden, May 12, 1982, 8202979

Int. Cl.³ B29H *17/36*

U.S. Cl. 156—96 **3 Claims**

1. A method of retreading vehicle tires in a pressurized atmosphere at a generally ambient temperature in the absence of a prevulcanization step comprising the steps of, providing an assembly comprising an unvulcanized tie-gum layer between a prevulcanized tire carcass and a prevulcanized tread, locating a microwave applicator above the tread and emitting microwaves to the assembly and thereby to create heat energy in the assembly to cause the tie-gum layer to be vulcanized, and effecting localized heating of the longitudinal edges of the tie-gum layer by attaching material with a high dissipation factor at the outer portions of the assembly adjacent the longitudinal edges of the tie-gum layer to compensate for cooling losses from the edges of the tie-gum layer, which material is retained throughout the vulcanization of the tie-gum layer thereby assuring vulcanization of said tie-gum layer at the edges by compensating for cooling losses at the tie-gum edges



and assuring a generally flat vulcanizing temperature gradient from edge to edge of the tie-gum layer.

4,536,243

METHOD AND APPARATUS FOR MAKING A METAL CAN

Tsuneo Imatani, Yokosuka; Hisakazu Yasumuro; Michio Watanabe, both of Yokohama; Hideo Kurashima, Yokosuka, and Kazuhisa Ishibashi, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

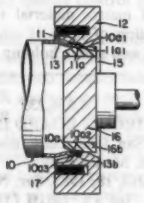
PCT No. PCT/JP83/00072, § 371 Date Nov. 2, 1983, § 102(e) Date Nov. 2, 1983, PCT Pub. No. WO83/03066, PCT Pub. Date Sep. 15, 1983

PCT Filed Mar. 8, 1983, Ser. No. 552,057

Claims priority, application Japan, Mar. 8, 1982, 57-35181; Mar. 19, 1982, 57-42521; Apr. 6, 1982, 57-56069

Int. Cl.³ B29C *19/04*

U.S. Cl. 156—274.6 **10 Claims**



1. A method of making a metal can having an annular seam formed by joining the open end portions of first and second can sections via an adhesive layer, said method comprising the steps of reducing the diameter of the open end portion of the first can section to provide a reduced diameter portion having an outside diameter substantially equal to the inside diameter of the open end portion of the second can section, heat bonding a piece of thermoplastic tape onto the outer surface of the reduced diameter portion of the first can section so as to leave a portion projecting therefrom, folding the projecting portion of the tape substantially radially inwardly of the first can section to cause part of the projecting tape portion to come into contact with the edge of the open end portion of the first can section, further folding the rest of the projecting tape portion into forced contact with the inner surface of the open end portion of the first can section by inserting a mandrel thereinto, causing thermal adhesion of the tape to the edge and inner surface of the open end portion of the first can section by heating the open end portion of the first can section to more than a temperature at which the tape is fusible, while part of

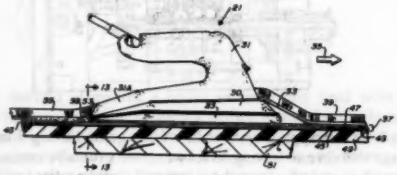
the tape is held pressed against the inner surface of the open end portion of the first can section, inserting the reduced diameter portion of the first can section into the open end portion of the second can section, and causing thermal adhesion of that part of the tape which overlies the outer surface of the reduced diameter portion of the first can section to the inner surface of the open end portion of the second can section to form the annular seam by heating at least the open end portion of the second can section.

4,536,244

METHODS AND APPARATUS FOR LOCKING THE FACING EDGES OF CARPET BACKINGS DIRECTLY TOGETHER AT THE SEAM DURING A FACE SEAMING OPERATION WITH A HOT MELT ADHESIVE TAPE

John J. Greci, Livermore, and Merle C. Hoopengardner, Lafayette, both of Calif., assignors to Orcon Corporation, Union City, Calif.

Filed Jul. 2, 1984, Ser. No. 626,658
Int. Cl.³ B31F 5/06; B65H 69/02; D06F 75/08
U.S. Cl. 156—304.4 26 Claims



1. A carpet seaming iron of the kind used for making a face seam between two pieces of carpet by heating a layer of hot melt adhesive on a carpet seaming tape positioned beneath the carpet backings at the seam and extending along the length of the seam, said iron comprising,

baseplate means having a lower surface engagable with the hot melt adhesive layer on the tape for heating the hot melt adhesive to a molten condition as the iron is moved along the tape,

handle means for manually moving the iron along the tape and beneath the carpet backings at the seam,

surface means on the upper surface of the iron and engagable with the undersides of the carpet backings for progressively lifting the backings from the tape at the front of the iron, as the iron is moved along the tape, and then lowering the backings onto the layer of molten adhesive at the back of the iron and,

groove means formed in the lower surface of the baseplate means and including a longitudinally extending, center groove having a length, depth, width, and alignment effective to form, in the layer of molten adhesive produced behind the moving iron, a raised center bead of a sufficient height and stiffness to coat the side edges of the carpet backings with hot melt adhesive as the undersides of the carpet backings are lowered onto the layer of molten adhesive and to thereby cause said side edges of the backings to be locked directly together through the adhesive interposed between said side edges.

17. A method of making a face seam between two pieces of carpet by heating a layer of hot melt adhesive on a carpet seaming tape which is positioned beneath the carpet backings at the seam and which extends along the length of the seam, said method comprising,

heating the hot melt adhesive to a molten condition,

simultaneously forming a raised center bead of molten adhesive of sufficient height and stiffness to coat the side edges of the carpet backings with the molten hot melt adhesive,

coating the side edges of the carpet backings with the molten adhesive from the raised center bead, and

completing the face seam by engaging the adhesively coated side edges of the carpet backings in contact with each other while engaging the undersides of the carpet backings with the layer of molten adhesive on the underlying tape and maintaining the engagement until the molten hot melt adhesive cools to a solid condition to thereby cause the side edges of the backings to be locked directly together through the adhesive interposed between said side edges.

4,536,245

LOW FORMALDEHYDE EMISSION UREA-FORMALDEHYDE RESINS CONTAINING A MELAMINE ADDITIVE

David W. Shiau, Louisville, Ky., and Eric Smith, New Albany, Ind., assignors to Borden, Inc., Columbus, Ohio

Filed Oct. 11, 1983, Ser. No. 540,305
Int. Cl.³ C09J 5/02
U.S. Cl. 156—307.3 36 Claims

1. A process for adhesively securing a first item to a second using a curable melamine-urea-formaldehyde base resin, comprising

disposing between a first item and a second item a binding amount upon curing of a curable melamine-urea-formaldehyde base resin comprising a melamine-urea-formaldehyde condensate that has a final molar ratio of formaldehyde to urea of 1.3:1 to 0.9:1, a final molar ratio of a formaldehyde to urea-equivalent of 1.3:1 to 0.7:1, and a melamine content of from 0.15% to 40% by weight of said condensate, dry solids basis, the melamine being incorporated in the resin, wherein said condensate is formed from an initial reaction mixture comprising urea and formaldehyde and having a molar ratio of formaldehyde to urea of from 3:1 to 1:1, that has undergone a methylolation reaction at an alkaline pH, been adjusted in pH to 6.0 to 8.3, had any remaining amount of urea and melamine added, then been condensed,

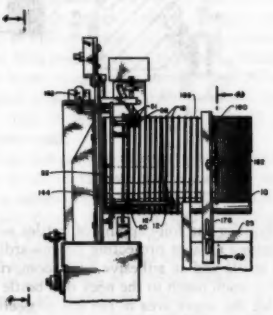
then curing said resin, said cured resin being characterized by a formaldehyde emission, as determined by the two hour desiccator procedure of the National Particleboard Association, not in excess of about 0.4 micrograms per ml.

4,536,246

FLEXIBLE DUCT FORMING APPARATUS

Hugh K. McGuire, 5220 Satsuma, North Hollywood, Calif. 91601

Continuation-in-part of Ser. No. 161,425, Jun. 20, 1980, Pat. No. 4,351,682. This application Sep. 27, 1982, Ser. No. 423,669
Int. Cl.³ B65H 81/00
U.S. Cl. 156—429 27 Claims



1. A flexible duct forming apparatus comprising:

a base;

a mandrel;

support means on said base for rotatably supporting said mandrel;

drive means for rotatably driving said mandrel; said drive means comprising;
a pinion gear mounted on said base,
a gear mounted on the rear of said mandrel;
motor means for driving said pinion gear;
said mandrel support means adapted to move said mandrel to bring said mandrel gear in engagement with said pinion gear;
flexible strip material feed means for feeding flexible strip material to said mandrel;
wrapping means for wrapping said flexible strip onto said mandrel in a helical path with adjacent wraps having overlapping edges;
wire feed means comprising;
wire deforming means for deforming said wire to produce a predetermined coil diameter,
wire guide means forming a substantially fixed helical path of constant pitch and diameter for guiding and holding said wire on said substantially fixed helical path from said wire deforming means to between the overlapping edges of said flexible strip material,
sealing means for sealing the overlapping edge of said flexible strip material to encapsulate said wire whereby flexible wire reinforced duct is continuously formed on said mandrel;
arcuate guide means for guiding completed duct off said mandrel;
said guide means constructed and arranged to ride in the depression between adjacent revolutions of the reinforcing wire to stretch completed duct as it is comes off the mandrel thereby testing the bond at the overlapping edges of said flexible material.

4,536,247

METHOD AND APPARATUS FOR FOIL-CAPPING BOTTLES

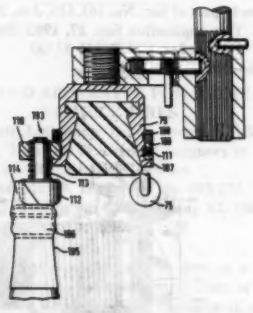
Rainer Buchholz, Düsseldorf; Josef Tomashauser, Tönisvorst; Rudolf Zodrow, Düsseldorf, and Hans-Werner Mohn, Kaarst, all of Fed. Rep. of Germany, assignors to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Division of Ser. No. 314,335, Oct. 23, 1981, Pat. No. 4,414,056. This application Sep. 16, 1983, Ser. No. 533,385

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046615; Feb. 11, 1981, 3104807

Int. Cl.³ B65C *3/20, 9/36*

U.S. Cl. 156—477.1 **2 Claims**



1. A method for the foil-capping of bottles with a patch of metal foil having an area projecting downwardly beyond the neck of the bottle and an adhesive back, comprising

(a) adhering each patch to the neck of a bottle by its central area with the upper area of the foil projecting above the bottle neck,

(b) applying the laterally projecting patch ends so that they overlap one another, the upwardly projecting area of the patch thereby constituting a collar-like upstanding patch portion,

(c) folding down the collar-like upstanding patch portion over the top of the bottle neck in two steps and from opposite sides,

(d) simultaneously pressing down and smoothing the folded down patch area onto the top side and all about the circumferential margin adjacent thereto.

4,536,248

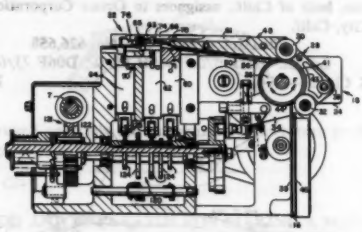
STRAPPING APPARATUS

Robert E. Bullington, Bear, Del., and James L. Discavage, Brookhaven, Pa., assignors to Cyklop International Emil Hoffmann KG, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 516,928

Int. Cl.³ B26D *7/06*

U.S. Cl. 156—502 **12 Claims**



1. In a strapping apparatus, a front guide having a first passage therein and having its forward end pivotally connected to a rocker arm of a strap drive assembly; said rocker arm having feed and tension nips which cooperate with a feed wheel to propel the strap through said passage; whereby a substantially constant gap is provided between the region of exit of the strap from between said feed nip and said drive wheel and said front guide thereby minimizing jamming and abrading of the strap.

4,536,249

INTEGRATED CIRCUIT PROCESSING METHODS

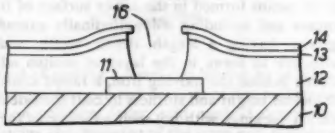
Stephen J. Rhodes, Northampton, England, assignor to Plessey Overseas Limited, Illford, England

Filed Apr. 6, 1984, Ser. No. 597,426

Claims priority, application United Kingdom, Apr. 6, 1983, 8309341

Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*; C23F *1/02*

U.S. Cl. 156—643 **11 Claims**



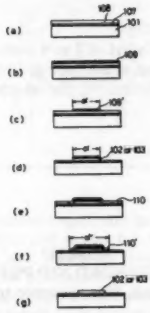
1. An integrated circuit processing method, comprising the steps of: providing on a substrate a first metallised conductor pattern, forming a layer of an insulating material over the first conductor pattern, coating the insulating layer with a parting layer of a material which is soluble in a solvent which does not damage the insulating layer or the conductor pattern, depositing over the parting layer a masking layer which is resistant to plasma etching, forming apertures in the masking layer at predetermined positions to define required via outlines, plasma etching through the masking layer to form vias in the insulating layer communicating with the first metallised conductor pattern, removing the masking layer by exposing the parting layer to the solvent, and forming onto the insulating layer a second level metallised conductor pattern to communicate with the first conductor pattern in the via.

4,536,250

METHOD OF MAKING LIQUID JET RECORDING HEAD

Masami Ikeda, Machida; Hiroto Matsuda, Ebina; Makoto Shibata, and Hiroto Takahashi, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,150
Claims priority, application Japan, Apr. 20, 1983, 58-69586
Int. Cl.[3] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—651 4 Claims



1. A method of making a liquid jet recording head with a liquid discharge section, including orifice means for discharging liquid to form flying droplets thereof and liquid passage means communicating with said orifice means and having a thermally acting portion for causing thermal energy to act on the liquid to form said liquid droplets, said thermally acting portion including a heat generating resistive portion on a substrate between at least one pair of opposed electrodes electrically connected with said heat generating resistive portion, said method comprising the steps of:

performing a first etching process including providing a first photoresist pattern having a predetermined width to cover a portion of a layer on said substrate and forming at least one of said electrodes and said heat generating portion by etching the exposed portion of said layer; and

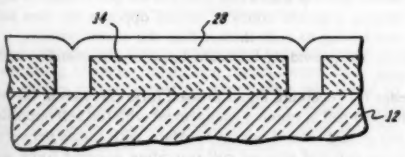
performing a second etching process including providing a second photoresist pattern having a width greater than the width of said first photoresist pattern to enable removal of remnants of said exposed portion of said layer not removed in said first etching process.

4,536,251

METHOD FOR ELIMINATING LASER-INDUCED SUBSTRATE FISSURES ASSOCIATED WITH CRYSTALLIZED SILICON AREAS

Anne Chiang, Cupertino, and William P. Meuli, Sunnyvale, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 4, 1984, Ser. No. 617,002
Int. Cl.[3] B44C *1/22*; C03C *15/00, 25/06*; C30B *13/06*
U.S. Cl. 156—657 10 Claims



1. A method for eliminating laser induced substrate fissures associated with crystallized silicon areas comprising the steps of

providing a substrate,

depositing a layer of polycrystalline semiconductor material upon said substrate,

patterning said polycrystalline layer to form an array of areas,

depositing an encapsulating layer over said patterned polycrystalline layer,

applying thermal energy to said patterned polycrystalline layer for melting said areas and heating said substrate,

cooling said areas and said substrate to control resolidification of said areas into single crystals,

annealing said areas and said substrate in a heated oxidizing atmosphere, and

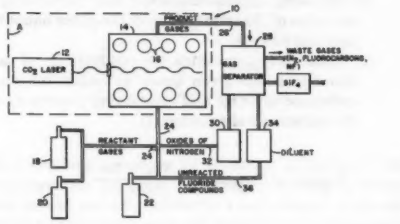
removing said encapsulating layer by etching.

4,536,252

LASER-INDUCED PRODUCTION OF NITROSYL FLUORIDE FOR ETCHING OF SEMICONDUCTOR SURFACES

Joseph K. McDonald, Athens, Ala., and James E. Merritt, Pulaski, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 7, 1985, Ser. No. 699,283
Int. Cl.[3] H01L *21/265*
U.S. Cl. 156—662 5 Claims



1. A method for laser-induced production of gaseous nitrosyl fluoride for the continuous etching of a semiconductor silicon wafer by gaseous nitrosyl fluoride, said method comprising:

(i) filling a laser reaction cell with a gaseous mixture of a catalyst compound of an oxide of nitrogen selected from the group of nitrogen oxide compounds consisting of NO, N_2O, and NO_2 and a fluoro compound selected from the group of fluoro compounds consisting of NF_3 and N_2F_4, said catalyst compound introduced into said laser reaction cell in a ratio of about 60 torr to about 45 torr of said fluoro compound,

(ii) irradiating said gaseous mixture with a power level from about 25 to about 150 watts of a cw CO_2 tunable laser, tuned to a radiation line that is resonant with an absorption band of said fluoro compound, said irradiating being carried out for a predetermined time period based on a predetermined power level of said laser to thereby achieve a continuous production of gaseous nitrosyl fluoride,

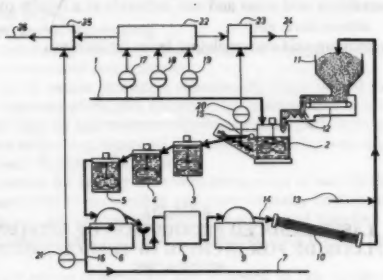
(iii) exposing a semiconductor silicon material to said gaseous nitrosyl fluoride to react said gaseous nitrosyl fluoride with the exposed semiconductor silicon material to achieve etching while producing SiF_4 and NO from said reacting; and,

(iv) recovering said etched semiconductor silicon material, said SiF_4, and said NO.

4,536,253
PROCESS FOR CONTROLLING THE PROPERTIES OF WHITE LIQUOR

Per M. Bertelsen, Allerod, Denmark, assignor to Kemotron A/S, Lyngby, Denmark

Filed Sep. 24, 1982, Ser. No. 423,254
Claims priority, application Denmark, Sep. 25, 1981, 4242/81
Int. Cl.³ D21C *11/12*
U.S. Cl. 162—30.11 **12 Claims**



1. A method of controlling the causticizing process of green liquor in the sulphate process, which produces an alkaline white liquor for pulping of wood, comprising:

(a) measuring immediately after the causticizing process, the value of the electric conductivity of the white liquor formed thereby;

(b) measuring immediately before said causticizing process, the value of the conductivity of the green liquor being fed into said process;

(c) numerically correlating the conductivity of said white liquor and said green liquor to obtain the reaction of carbonate value for said causticizing process by means of the mathematical equation (I)

$$\text{Reaction of Carbonate} = \frac{K_{Hv} - K_{Gr}}{f_1(TTA)}$$

wherein

$$f_1(TTA) = 4.694 \times 10^{-5} \times TTA^2 - 2.652 \times 10^{-2} TTA + 7.335 \frac{\text{mS/cm}}{\text{g/l}};$$

K_{Hv} and K_{Gr} are the conductivities of the white liquor and the green liquor, respectively and TTA is the total titratable alkali of the green liquor; and

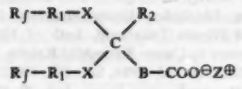
(d) adjusting the reaction of carbonate of said causticizing process based on the reaction of carbonate value obtained in step (c).

4,536,254
AMMONIUM AND AMINE SALTS OF DI-PERFLUOROALKYL GROUP CONTAINING ACIDS AND COMPOSITIONS AND USE THEREOF

Robert A. Falk, New York, and Istvan Borsodi, Yonkers, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 515,755, Jul. 21, 1983, abandoned, which is a division of Ser. No. 292,326, Aug. 12, 1981, Pat. No. 4,419,298. This application Jul. 23, 1984, Ser. No. 632,686
Int. Cl.³ D21H *3/08*
U.S. Cl. 162—135 **16 Claims**

1. An aqueous emulsion concentrate containing 5% to 40% by weight of a compound of the formula



wherein

R_f is perfluoroalkyl of 6 to 14 carbon atoms;

R_1 is straight or branched chain alkylene of 2 to 8 carbon atoms;

X is —S— or —SO_2—;

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms;

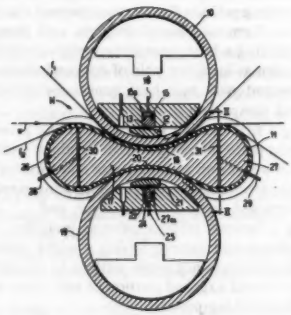
B is a covalent bond or alkylene of 1 to 6 carbon atoms; and

Z is the cation of mono-, di-, or tri-ethanolamine.

4,536,255
EXTENDED NIP PRESS

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Dec. 7, 1983, Ser. No. 558,837
Int. Cl.³ D21F *3/00, 3/04, 3/08*
U.S. Cl. 162—358 **3 Claims**



1. A press mechanism for removing liquid from a traveling fibrous web comprising in combination:

a press nip formed between first and second members for receiving a traveling fibrous web therebetween;

the first of said members being a cylindrical press roll;

the second member being an endless belt wrapping a portion of the roll to form the nip;

a mandrel within the belt essentially of a size to fill the inside of the belt, said mandrel directly supporting the entire belt, and extending in a cross-machine direction and having a center portion with a first concave surface facing the nip and having a second concave surface opposite the first surface and having its ends thicker than the center portion;

means for providing lubricant between the mandrel and the belt;

means for receiving liquid pressed form the web in the nip;

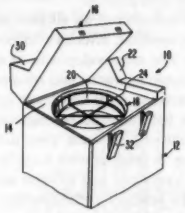
a support roll in running engagement with the belt opposite the nip at said second concave surface with forces between the press roll and support roll providing pressing force within the nip;

and means defining lubricant delivery passages extending through the mandrel and opening from the mandrel surface to provide said means for supplying lubricant between the mandrel and belt.

4,536,256
SOLVENT RECOVERY APPARATUS

Manuel G. Pastor, Berkeley, Calif., assignor to Recyclene Products, Inc., San Jose, Calif.

Filed Jul. 20, 1983, Ser. No. 516,008
Int. Cl.[3] B01D 3/02
U.S. Cl. 202—164 30 Claims



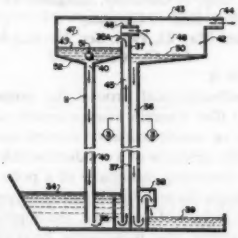
1. In a solvent recovery apparatus having means for providing a distilling mode and means for providing an emptying mode, including a tank, means for heating the interior of said tank, a plastic bag for placement within said tank interior such that the bag is designed, positioned and dimensioned for forming a substantially liquid tight barrier between contaminated solvent within said bag and said means for heating during said distilling mode and for enabling easy removal and disposal of said plastic bag with quantities of residue remaining in the bag from evaporation of said contaminated solvent during said emptying mode, the combination with said tank of:

means for shaping the bag and for holding said bag against the inner surface of said tank during said distilling mode and for supporting said bag with said quantities of residue during said emptying mode.

4,536,257
DESALINATION SYSTEM

George Atwell, 891 St. Gabriel Ave., St. Norbert, Manitoba, Canada R3V 1E9

Filed May 3, 1982, Ser. No. 374,071
Claims priority, application United Kingdom, May 6, 1981, 8113804
Int. Cl.[3] B01D 3/10
U.S. Cl. 202—177 22 Claims

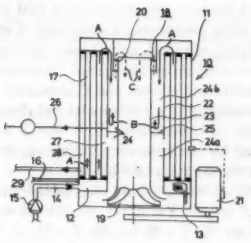


1. A desalination system comprising in combination a sealed evaporating chamber, intake and return means for connection to a supply of salt water for circulating salt water to said evaporating chamber for evaporation, a sealed condensing chamber, conduit means operatively extending between said evaporating chamber and said condensing chamber for transferring water vapour from said evaporating chamber to said condensing chamber, an external vacuum pump operatively connected to one of said evaporating and condensing chambers and designed so as in operation to maintain said chambers at a pressure closely approaching the vapour pressure of water at ambient temperature, fresh water outlet means operatively connected to said condensing chamber, and means for condensing said water vapour in said condensing chamber said condensing means consisting of fan means for transferring water vapour through said conduit means from said evaporating chamber to said condensing chamber whereby said water vapour condenses without contacting a cooling medium.

4,536,258
DISTILLING APPARATUS OPERATING ON THE THERMOCOMPRESSOR PRINCIPLE

Esko Huhta-Koivisto, Espoo, Finland, assignor to Oy Finn-Aqua Ltd., Finland

Filed May 18, 1984, Ser. No. 611,878
Claims priority, application Finland, May 20, 1983, 831797
The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.
Int. Cl.[3] B01D 1/06, 1/28, 3/04
U.S. Cl. 202—180 16 Claims



1. In a distilling apparatus for operation according to the thermocompressor principle, including a housing, a boiling chamber at least partially defined by a wall situated within the housing and adapted to contain the liquid to be distilled, means for heating the liquid to be distilled contained in the boiling chamber to produce a vapor, feed line means for conducting liquid to be distilled into the boiling chamber, means for imparting additional energy to the vapor produced in the boiling chamber having an inlet side to which the vapor formed in the boiling chamber is directed and an outlet side from which the vapor is discharged at an increased temperature, distillate removal line means for withdrawing distillate from the distilling apparatus, at least one heat exchange tube provided within the housing of the distilling apparatus and arranged such that a fluid stream composed of at least one of liquid to be distilled and vapor flows therethrough, and droplet separation means provided within the housing,

the improvement comprising

tubular means disposed within the apparatus to define an inner conduit and an outer annular flow duct,

means for dividing said outer annular flow duct into an upper portion and a lower portion,

aperture means provided in one of said two portions of said annular flow duct, and

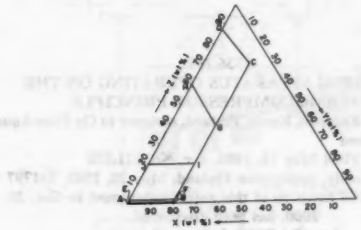
said energy imparting means being disposed within said housing such that after the fluid stream flows through the at least one heat exchange tube and through said inner conduit, vapor flows through said energy imparting means which conveys the same into one of said two portions of said annular flow duct, whereby the vapor discharges from the same to be condensed.

4,536,259

CATHODE HAVING HIGH DURABILITY AND LOW HYDROGEN OVERVOLTAGE AND PROCESS FOR THE PRODUCTION THEREOF

Yoshio Oda; Hiroshi Otouma, and Eiji Endoh, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 8, 1983, Ser. No. 511,945
Claims priority, application Japan, Jul. 16, 1982, 57-122898
Int. Cl.³ C25D 15/00, 3/56
U.S. Cl. 204—35.1 12 Claims



1. A cathode having high durability and low hydrogen overvoltage comprising an electrode substrate and an alloy layer formed thereon, characterized in that said alloy layer is made of an alloy comprising Component X selected from the group consisting of nickel, cobalt and a mixture thereof, Component Y selected from the group consisting of aluminum, zinc, magnesium and silicon, and Component Z selected from the group consisting of a noble metal and rhenium, and having a composition of Components X, Y and Z falling within the range defined by the following points A, B, C and D with reference to the diagram of FIG. 1:

A: X=99.6 wt. %, Y=0 wt. %, Z=0.4 wt. %
B: X=79.6 wt. %, Y=20 wt. %, Z=0.4 wt. %
C: X=10 wt. %, Y=20 wt. %, Z=70 wt. %
D: X=12.5 wt. %, Y=0 wt. %, Z=87.5 wt. %.

4,536,260

THIN FILM CADMIUM SELENIDE ELECTRODEPOSITED FROM SELENOSULPHITE SOLUTION

Michael Cocivera, Guelph, Canada, assignor to University of Guelph, Guelph, Canada

Filed May 14, 1984, Ser. No. 609,971
Int. Cl.³ C25D 5/50, 9/08
U.S. Cl. 204—37.1 15 Claims

1. In a process for electrodepositing a thin layer of cadmium selenide on a suitable electrically conductive substrate comprising immersing a cathode of said substrate in association with an anode in an electrolyte bath having a pH ranging from 5 to 10 and having an aqueous solution of selenosulphite ions and cadmium ions complexed with a complexing agent where said pH range shifts the chemical equilibrium of complexing said cadmium ions towards associated complexed cadmium ions, applying a voltage across said cathode and anode to reduce said selenosulphite ions to produce selenide ions at said cathode of a sufficient concentration which reacts with the complexed cadmium ions to electrodeposit thereby cadmium selenide on said cathode and annealing said electrodeposited cadmium selenide, the improvement comprising the use of nitrilotriacetic acid as said complexing agent.

4,536,261

ALKALINE BATH FOR THE ELECTRODEPOSITION OF BRIGHT ZINC

Francine Popescu, 94490 Ormesson, France

Filed Aug. 7, 1984, Ser. No. 638,435
Int. Cl.³ C25D 3/22
U.S. Cl. 204—55 R 21 Claims

1. An aqueous alkaline electroplating bath for bright zinc electrodeposition, comprising:

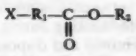
(a) an aqueous solution of an alkaline zincate, and

(b) a sufficient amount, effective to provide bright, ductile and uniform zinc electrodeposits, of a nitrogen-containing polymer, soluble in water, and obtained by the successive chemical reactions A, B and C, as follows:

Reaction A: A heterocyclic pentagonal or hexagonal compound, comprising at least two nitrogen atoms in the aromatic ring, is reacted with a cyclic carbonate comprising carbon, hydrogen and oxygen atoms;

Reaction B: The product of the reaction A is further reacted with an epihalohydrin or an alpha-dihalohydrin, in order to obtain an intermediary, water soluble, nitrogen-containing polymer;

Reaction C: The product of reaction B is further reacted with a compound of general formula (1):



wherein:

X represents a hydrogen atom or a phenyl radical;

R_1 represents an alkenylene, alkylene, haloalkenylene, hydroxyalkenylene or carboxy (hydroxy) alkenylene group; and

R_2 represents a hydrogen atom or an alkyl, hydroxyalkyl, haloalkyl or halohydroxyalkyl.

8. The bath as defined in claim 1 and containing additionally a secondary brightener in concentration of 0.05 to 10.0 g/l.

4,536,262

PREPARATION OF POLY(HETEROAROMATICS), AND FILMS OBTAINED BY THIS METHOD

Gerhard Wegner, Denzlingen, and Wolfgang Wernet, Freiburg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,348
Int. Cl.³ C25B 3/02
U.S. Cl. 204—56 R 6 Claims

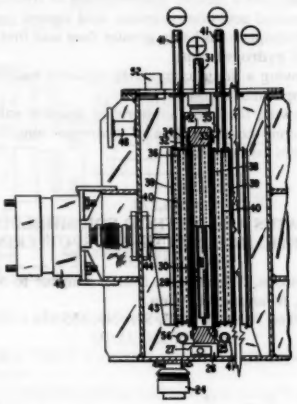
1. In an electrochemical process for preparing a poly(-heteroaromatic) film wherein heteroaromatic compounds are polymerized by an anodic oxidation carried out in an electrolyte solvent in the presence of a conductive salt with the electrolyte solvent consisting essentially of a polar organic compound, and wherein the resulting polymer deposits in the form of a film on the surface of the anode, the improvement which comprises: dispersing said monomeric heteroaromatic compounds in an aqueous electrolyte solvent consisting of at least 80 percent by weight of water and to which has been added a water soluble dispersant selected from the group consisting of a neutral emulsifier, an anionic emulsifier or a mixture thereof together with the further addition of a conductive salt, with the proviso that a conductive salt need not be present when an anionic emulsifier is employed as the sole dispersant, introducing the resulting composition into an electrolytic cell and subjecting said monomeric compounds dispersed therein to an anodic oxidation to effect a polymerization thereof and deposition of the resulting polymer in the form of a film onto the anode surface of said electrolytic cell.

4,536,263

PROCESS FOR GENERATING HALOGEN USING NOVEL ELECTROLYSIS CELL

Oronzio deNora, Milan, Italy, and Placido M. Spaziante, Lugano, Switzerland, assignors to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 382,670, May 27, 1982, , which is a division of Ser. No. 151,695, May 20, 1980, Pat. No. 4,341,604, which is a continuation-in-part of Ser. No. 57,255, Jul. 12, 1979, Pat. No. 4,343,689. This application Oct. 13, 1983, Ser. No. 541,554
Claims priority, application Italy, Jul. 27, 1978, 26171 A/78
Int. Cl.³ C25B *1/46*
U.S. Cl. 204—98 2 Claims



1. A method of generating halogen comprising electrolyzing an aqueous halide solution in an electrolytic cell having an anode compartment separated from a cathode compartment by an ion exchange diaphragm capable of transmitting cations therethrough but impermeable to the flow of electrolyte, a foraminous anode and a foraminous cathode being pressed against opposite sides of the diaphragm, at least one of said anode or cathode comprising at least two superimposed layers of different mesh size with the finer layer being between the diaphragm and the coarser layer, feeding aqueous alkali metal halide solution into the anode compartment and into contact with the anode, maintaining water in contact with the cathode and maintaining an electrolyzing potential between said anode and cathode.

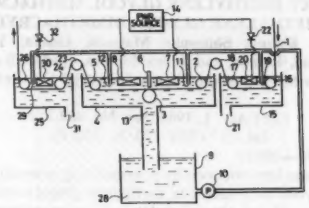
4,536,264

METHOD FOR ELECTROLYTIC TREATMENT

Takanori Masuda; Tsutomu Kakei; Teruo Miyashita; Akira Morita, all of Shizuoka, and Masahiro Takahashi, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd. and Nippon Light Metal Company, Ltd., both of, Japan

Filed Sep. 21, 1984, Ser. No. 652,996
Claims priority, application Japan, Sep. 21, 1983, 58-173148
Int. Cl.³ C25F *3/02, 3/04, 7/00*
U.S. Cl. 204—129.43 6 Claims

1. In a method for continuously electrolytically processing a metal web using graphite electodes and a symmetric alternating waveform current, the improvement wherein a part of a half cycle of said current is bypassed into at least one separately provided auxiliary anode through diode means so that the magnitude of a current contributing to a cathode reaction on surfaces of said graphite electrodes is larger than the magnitude of a current contributing to an anode reaction on said surfaces of said graphite electrodes.



4,536,265

SILOXANE POLYPHOTOINITIATORS OF THE SUBSTITUTED ACETOPHENONE TYPE

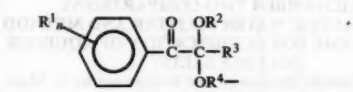
Louis F. Fabrizio, Hartford, Conn.; Samuel O. S. Lin, Edgewater, N.J., and Anthony F. Jacobine, Meriden, Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Apr. 19, 1984, Ser. No. 601,881
Int. Cl.³ C08F *2/46*
U.S. Cl. 204—159.13 8 Claims

1. An organopolysiloxane photoinitiator having an average of at least two siloxane units, of which at least an average of one siloxane units per organopolysiloxane molecule has the formula:

$$X_aR_bSiO_{(4-a-b)/2}$$

wherein a is an integer of 1–3, b is an integer of 0–2 and a plus b equals 1–3; R is C_1–C_{10} hydrocarbyl or halogen substituted C_1–C_{10} hydrocarbyl; and X is substituted acetophenone photomoiety of the formula:



where R^1 is any substituent which will not interfere with hydrosilation, n is an integer between 0 and 4; R^2 is organosilyl substituted alkyl or alkenyl; R^3 is H, alkyl or aryl; and R^4 is a divalent hydrocarbon group having between 2 and 10 carbon atoms.

4,536,266

PROCESS FOR THE FLUORINATION OF A SURFACE LAYER OF FORMED BODIES MADE OF PLASTICS

Claus Bliefert, Schöppingen; Hans-Michael Boldhaus, Bad Bentheim, and Manfred Hoffmann, Ochtrup, all of Fed. Rep. of Germany, assignors to Hewing GmbH & Co., Ochtrup, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 558,796
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245915
Int. Cl.³ C08F *8/22*
U.S. Cl. 204—159.18 16 Claims

1. Method for fluorinating surface layers of articles molded from macromolecular polymeric materials capable of being fluorinated which comprises exposure of at least a portion of said article to a fluorine-containing liquid consisting essentially of elemental fluorine dissolved in a solvent or solvent mixture which are essentially inert with respect to fluorine and said article and reacting said elemental fluorine with said surface layers.

4,536,267
PLASTIC LENS OF NEOPENTYL GLYCOL DIMETHACRYLATE COPOLYMERIZED WITH METHOXY DIETHYLENE GLYCOL METHACRYLATE OR DIETHYLENE GLYCOL DIMETHACRYLATE

Akio Ito, Katano; Shunsuke Matsuda, Osaka; Yoshinobu Murakami, Katano, and Tooru Tamura, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 1, 1983, Ser. No. 482,311
Int. Cl.³ C08F *120/10, 220/10*
U.S. Cl. 204—159.23 **3 Claims**

1. A plastic lens obtained by polymerizing neopentyl glycol dimethacrylate with methoxy diethylene glycol methacrylate or diethylene glycol dimethacrylate, said polymerization being performed in the presence of a photopolymerization initiator and a polymerization catalyst which is methyl ethyl ketone peroxide, the transmittivity of said lens being at least 75%.

4,536,268
PROCESS FOR THE REDUCTION OF THE VISCOSITY OF HIGH SOLIDS PIGMENT SLURRIES

Earl R. Lawhorne, Savannah, Ga., assignor to American Cyanamid Company, Stamford, Conn.

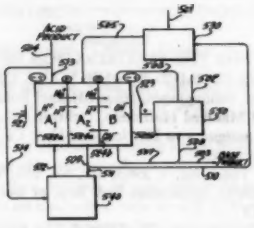
Filed Mar. 12, 1984, Ser. No. 588,264
Int. Cl.³ B01D *57/02*
U.S. Cl. 204—182.4 **4 Claims**

1. A method for reducing the viscosity of an aqueous pigment slurry which comprises
(a) placing a high solids content TiO_2 pigment slurry into a cathode compartment separated from an anode compartment by a low porosity permeable membrane,
(b) placing an ammonium or dilute acid anolyte solution in said anode compartment,
(c) passing electric current through said cathode and anode compartments and
(d) recovering the resultant pigment slurry, whereby said slurry is of a reduced viscosity.

4,536,269
MULTICHAMBER TWO-COMPARTMENT ELECTRODIALYTIC WATER SPLITTER AND METHOD OF USING SAME FOR ACIDIFICATION OF AQUEOUS SOLUBLE SALTS

Frederick P. Chlanda, Rockaway, and Krishnamurthy N. Mani, Denville, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 2, 1983, Ser. No. 490,946
Int. Cl.³ B01D *13/02*
U.S. Cl. 204—182.4 **18 Claims**

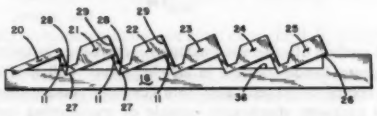


1. A method for generating an acidified solution and an aqueous base comprising the steps of:
(a) providing an electrodialytic water splitter comprising at least one unit cell, said at least one unit cell having at least a first acid compartment, a second acid compartment and a base compartment arranged such that the base compartment and first acid compartment are defined in part by a common first membrane and such that the first acid compartment and the second acid compartment are defined in part by a common second membrane, disposed between an anode and a cathode;
(b) introducing a liquid comprising water to the base compartment;
(c) introducing a liquid comprising an aqueous soluble salt to the first acid compartment;
(d) withdrawing liquid from the first acid compartment and transferring at least a portion of the liquid from the first acid compartment to the second acid compartment;
(e) passing direct current through said electrodialytic water splitter to produce a liquid comprising aqueous base in said base compartment, a liquid comprising aqueous soluble salt and a first concentration of hydrogen ions in said first acid compartment, and a liquid comprising aqueous soluble salt and a second concentration of hydrogen ions in said second acid compartment, said second concentration of hydrogen ions being greater than said first concentration of hydrogen ions;
(f) withdrawing a liquid comprising aqueous base from the base compartment; and
(g) withdrawing the liquid comprising aqueous soluble salt and a second concentration of hydrogen ions from said second acid compartment.

4,536,270
APPARATUS AND METHOD FOR SHIELDING MAGNETIC HEADS DURING A SPUTTERING OPERATION

Robert A. Johnson, Minnetonka, Minn., assignor to Magnetic Peripherals, Minneapolis, Minn.

Filed Nov. 28, 1983, Ser. No. 555,851
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **6 Claims**



1. A manufacturing assembly for controlling the deposition of material in a sputtering chamber, comprising a plurality of ferrite bars of the type from which elements of ferrite transducer cores are cut, said ferrite bars each having on one side adjacent a first end and opposite a first corner partly defining the first end, a back gap face area, said back gap face area to be protected from deposition of material during a sputtering process; and a fixture having a plurality of upwardly facing parallel support grooves in each of which the first corner of a ferrite bar and the area surrounding it rests back gap face facing upward, said support grooves having a spatial arrangement supporting the ferrite bars with the ferrite bars in overlapping relationship with similar angular orientations, with each ferrite bar except one shielding and covering the back gap face of a neighbor, thereby preventing deposition of material on said shielded and covered back gap faces.

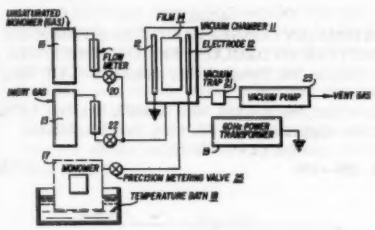
6. In a method for preparing for sputtering a material on a plurality of identical ferrite bars of the type from which elements of ferrite transducer cores are cut, said ferrite bars each having on one side adjacent a first end and opposite a first corner partly defining the first end a back gap face area, the steps of:
(a) forming in a substantially flat surface of a fixture a plurality of parallel support grooves into each of which the first corner of one of the ferrite bars and the area surrounding it may be laid back gap face facing upward, said support grooves having a spatial arrangement allowing a ferrite bar first corner to be laid in each groove with the ferrite bars in overlapping relationship with each ferrite bar except one shielding and covering the back gap face of a neighbor;

(b) orienting said fixture with its grooves facing generally upwards;
(c) placing a ferrite bar in each groove in overlapping relationship with each ferrite bar except one shielding and covering the back gap face of a neighbor; and
(d) placing the fixture with the ferrite bars laid on it in a sputtering chamber.

4,536,271
METHOD OF PLASMA TREATING A POLYMER FILM TO CHANGE ITS PROPERTIES

Gregory P. Collins, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,724
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—192 E 16 Claims



1. A method of strengthening a polymer film comprising the steps of:
placing said film in a vacuum chamber containing a pair of electrodes;
filling said chamber with a treatment gas under a pressure of 0.2–0.7 Torr;
applying a voltage to said electrodes to initiate a discharge in and ionization of said treatment gas; and
exposing said film to said ionized treatment gas for a predetermined period of time and thereby etching away a surface layer of said film.

4,536,272
POROUS ELECTRODE

Alain P. O. Blanchart, Balen, and Ludovicus C. M. Adriaensen, Deerlijk, both of Belgium, assignors to Electrochemische Energieconversie N.V., Mol, Belgium

Filed May 16, 1984, Ser. No. 610,802
Claims priority, application Netherlands, May 19, 1983, 8301780
Int. Cl.[3] C25B *11/04, 11/08*
U.S. Cl. 204—294 18 Claims

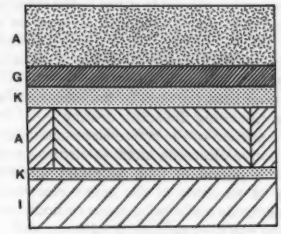
1. A porous electrode including a porous catalytic layer which comprises at least 3–30 parts by weight of moldable polymeric binder, 50–94 parts by weight of carbon particles, and 3–47 parts by weight of hard hydrophobic polymer particles.

4,536,273
DIFFUSION BARRIER FOR ALUMINIUM ELECTROLYSIS FURNACES

Arne Seltveit, Trondheim, Norway, assignor to Sintef, Trondheim, Norway

PCT No. PCT/NO83/00007, § 371 Date Oct. 19, 1983, § 102(e) Date Oct. 19, 1983, PCT Pub. No. WO83/03106, PCT Pub. Date Sep. 15, 1983
PCT Filed Mar. 4, 1983, Ser. No. 556,237
Claims priority, application Norway, Mar. 5, 1982, 820694
Int. Cl.[3] C25C *3/08;* C01B *33/26;* C04B *35/10; 35/16*
U.S. Cl. 204—243 R 4 Claims

1. A diffusion barrier for an electrolysis furnace for the preparation of aluminium by electrolysis of alumina dissolved in a fluoride melt, which diffusion barrier comprises at least one material selected from the group consisting of calcium aluminium silicates and mixtures of a calcium silicate and

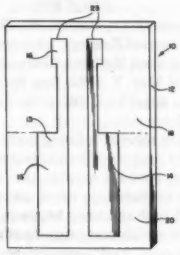


Al_2O_3 which do not absorb water and which react with sodium fluoride to form compounds which are solid at the operation temperature of the furnace.

4,536,274
PH AND CO_2 SENSING DEVICE AND METHOD OF MAKING THE SAME

Nicholas Papadakis, Concord, and Daniel G. Kalynchuk, University Heights, both of Ohio, assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Apr. 18, 1983, Ser. No. 486,024
Int. Cl.[3] G01N *27/56*
U.S. Cl. 204—433 13 Claims



1. A CO_2 gas sensor comprising:
an electrically nonconductive substrate;
a metal/metal oxide junction type active electrode including an active electrode metal, the active electrode metal being applied to the substrate by one of thick film and thin film techniques, and the active metal being then subjected to electro-oxidizing conditions for a period of time sufficient to oxidize a portion of the applied active electrode metal, the applied active electrode metal being made cathodic prior to discontinuance of the electro-oxidizing conditions;
a silver/silver halide junction type reference electrode, adheringly applied to the substrate;
an insulating, dielectric coating applied over at least portions of the substrate and electrodes;
and a polymeric membrane comprising a laminate of a hydrophobic polymeric material atop a hydrophilic membrane material applied over at least those portions of the electrodes not having the insulating dielectric coating applied thereto, the polymeric membrane being capable of relatively rapidly transmitting CO_2 thereacross, and the polymeric material including a liquid electrolyte bound by the polymeric membrane.

7. A method for making a CO_2 gas sensor comprising the steps:

selecting an electrically nonconducting substrate formed from a material selected from a group consisting essentially of ceramics, refractories, thermoplastics, and thermosetting resins;

applying an active electrode metal to the substrate by one of thick and thin film techniques to form an electrode of desired physical configuration adhered to the substrate;

adheringly applying to the substrate a silver/silver halide junction type reference electrode;

applying to at least portions of the electrodes and the substrate an insulating dielectric coating;

oxidizing a portion of the active electrode metal by subjecting the active electrode metal to electro-oxidizing conditions for a period of time necessary to form a desired quantity of an oxide of the active electrode metal, the active electrode metal being made cathodic prior to terminating the electro-oxidizing conditions; and

applying to at least those portions of the resulting sensor not having an applied coating of an insulating dielectric a polymeric membrane comprising a laminate of a hydrophobic polymeric material atop a hydrophilic membrane material capable of binding a liquid electrolyte within the polymeric membrane, electro-oxidation being accomplished by making the active electrode metal anodic within a fused salt electrolyte consisting of $NaNO_3$ and LiCl salts under an impressed current of between about 0.1 milliamperes and 20.0 milliamperes per square centimeter of active electrode metal surface, followed by making the now active electrode cathodic prior to removing the active electrode from the fused salt electrolyte.

4,536,275

INTEGRATED TWO-STAGE COAL LIQUEFACTION PROCESS

James C. Bronfenbrenner; Ronald W. Skinner, both of Allentown, Pa., and Samuel Znaimer, Vancouver, Canada, assignors to International Coal Refining Company, Allentown, Pa.

Filed Mar. 7, 1984, Ser. No. 586,937
Int. Cl.³ C10G *1/06, 1/00*
U.S. Cl. 208—10 **7 Claims**

1. A process for solvent refining coal with increased distillate production by recycle of hydrotreated asphaltenes that are pentane insoluble, benzene soluble and heavy preasphaltenes that are benzene insoluble, pyridine soluble in the absence of ash, unconverted coal and very heavy preasphaltenes that are pyridine insoluble which comprises forming a first stage slurry of finely divided coal, hydrogenated process solvent recycle hereinafter more specifically defined and hydrogen-rich gas, heating said slurry, passing said heated slurry to a dissolver vessel, dissolving at least a portion of said coal within said dissolver vessel, adding fresh hydrogen to form a liquified coal slurry, passing said liquified coal slurry to a vapor-liquid separator, separating a vapor product stream and a condensed liquid product stream, passing said condensed liquid product stream to a first stage distillation system to form a residual bottoms product and a hydrocracker solvent stream, removing said residual bottoms product to a critical solvent deashing zone, wherein said residual bottoms product is mixed with a deashing solvent to form a deashing stage slurry, passing said deashing stage slurry into a deashing separator to form deashing separator effluents consisting essentially of:

(i) a light upper phase containing asphaltenes that are pentane insoluble, benzene soluble;

(ii) a heavy lower phase containing preasphaltenes that are benzene insoluble, pyridine soluble; and

(iii) a very heavy lower phase containing unconverted coal, ash concentrates and very heavy preasphaltenes that are pyridine insoluble;

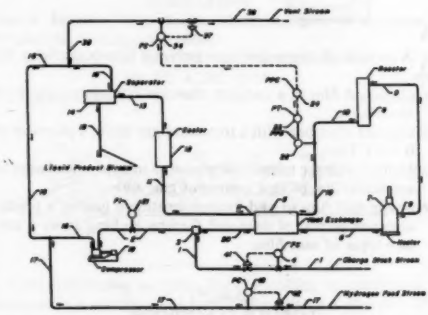
separating stream (iii) from the combination of streams (i) and (ii), passing said very heavy lower phase of stream (iii) to a gasification unit to generate hydrogen, mixing said light upper phase of stream (i) with said heavy lower phase of stream (ii) and passing said admixture with said hydrocracker solvent derived from said first distillation zone in combination therewith through a hydrocracker zone having a hydrocracker catalyst therein subject to deactivation, said hydrocracker zone being operated at a temperature of at least 700° F. (371° C.) and a pressure of at least 1500 psig (10375 kPa) to produce a hydrocracker effluent stream, passing said hydrocracker effluent stream to a hydrocracker flash unit to produce two streams, the first hydrocracker flash effluent stream containing 500° F.+ asphaltenes and preasphaltenes in the absence of ash, unconverted coal and very heavy preasphaltenes and the second stream containing 500° F.— as distillate product of said process, wherein substantially all of said first hydrocracker flash effluent stream containing said asphaltenes and preasphaltenes is passed as process solvent to slurry said coal and hydrogen to produce a greater quantity of distillates from said coal.

4,536,276

HYDROGEN CONSERVATION IN HYDROGEN RECYCLE HYDROCONVERSION PROCESSES

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 374,858, May 4, 1982, Pat. No. 4,476,094. This application Jun. 28, 1984, Ser. No. 625,416
Int. Cl.³ C10G *47/36, 45/72*
U.S. Cl. 208—100 **8 Claims**



1. A control method for reducing the vent flow of hydrogen in hydrocarbon conversion apparatus, thereby reducing usage of hydrogen in said conversion apparatus, where said conversion apparatus comprises (1) a conduit for transporting a charge stock stream comprising hydrocarbons in communication with a conduit for transporting a recycle hydrogen-hydrocarbon stream to mix said hydrocarbon charge stock stream with said recycle hydrogen-hydrocarbon stream; (2) a hydrocarbon reaction zone in communication with said charge stock stream conduit for converting said hydrocarbons in said charge stock to a converted hydrocarbon product; (3) a cooling zone in communication with said reaction zone, via a reaction zone effluent conduit, to cool said reaction zone product to form a cooling zone effluent stream comprising a liquid product component and a vaporous hydrogen-hydrocarbon component; (4) a separation zone in communication with said cooling zone, via a cooling zone effluent conduit, to separate said cooling zone effluent stream into a liquid product stream, which is withdrawn from the process, and a vaporous hydrogen-hydrocarbon stream which flows in a separation zone vaporous effluent conduit, wherein said vaporous stream is divided into at least a portion of said recycle hydrogen-hydrocarbon stream and vent hydrogen-hydrocarbon stream; (5) a compressor means in interconnection with said separation zone, via said separation zone vaporous effluent conduit, and also in interconnection with said charge stock conduit via said recycle hydrogen-hydrocarbon stream conduit; (6) a vent conduit in communication with said separation zone vaporous

effluent conduit, having an automatically variable flow restriction device therein, for removal of a portion of said vaporous hydrogen-hydrocarbon stream from said process; and (7) a conduit for transporting a hydrogen-containing feed stream in communication with said separation zone vaporous effluent conduit downstream of said vent conduit; said control method consisting of:

(a) sensing the hydrogen concentration of the entire reaction zone product in said reaction zone effluent conduit before any separation of said liquid product component from said vaporous hydrogen-hydrocarbon component;

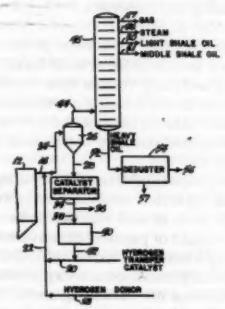
(b) comparing said sensed hydrogen concentration with a predetermined selected concentration of hydrogen and developing a signal correlating thereto; and

(c) transmitting said developed signal to said variable flow restriction device in said vent conduit to either: increase hydrogen concentration in said recycle stream when said sensed hydrogen of step (a) is smaller than said predetermined hydrogen concentration of step (b) by decreasing the degree of restriction of said variable flow restriction device in said vent conduit or decrease hydrogen concentration in said recycle stream when said sensed hydrogen of step (a) is larger than said predetermined hydrogen concentration of step (b) by increasing the degree of restriction of said variable flow restriction device in said vent conduit.

4,536,277
SHALE OIL STABILIZATION WITH A HYDROGEN DONOR QUENCH AND A HYDROGEN TRANSFER CATALYST

Thomas M. O'Grady, Naperville; David F. Tatterson, Downers Grove, and Ronald Coates, Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 24, 1984, Ser. No. 583,150
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—11 R **19 Claims**



1. A process for producing shale oil, comprising the steps of:

retorting raw oil shale in an aboveground retort by contacting said raw oil shale with heat carrier material at a retorting temperature to liberate an effluent dust-laden product stream comprising hydrocarbons and particulates of oil shale dust;

enhancing removal of said shale dust from said dust-laden product stream and stabilizing and limiting polymerization of said dust-laden product stream by contacting said dust-laden product stream comprising said hydrocarbons and said particulates of oil shale dust with a hydrogen donor quench in the presence of a hydrogen transfer catalyst at a pressure ranging from atmospheric pressure to about 50 psig;

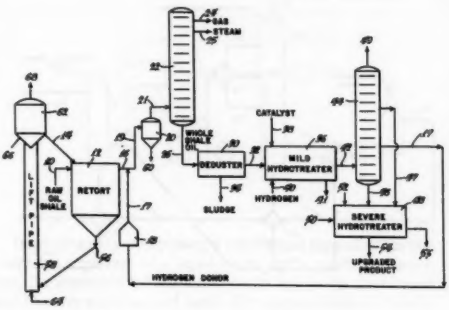
separating a fraction of shale oil containing said hydrogen donor quench and from substantially greater than 1% to about 70% by weight oil shale dust from said hydrogen donor quenched product stream; and

substantially removing said oil shale dust from said fraction.

4,536,278
SHALE OIL STABILIZATION WITH A HYDROGEN DONOR QUENCH

David F. Tatterson, Downers Grove; Thomas M. O'Grady, and Ronald Coates, both of Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 24, 1984, Ser. No. 583,321
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—11 R **22 Claims**



1. A process for producing shale oil, comprising the steps of:

retorting raw oil shale in an aboveground retort by contacting said raw oil shale with heat carrier material at a sufficient temperature in said retort to liberate an effluent dust-laden product stream comprising hydrocarbons and particulates of oil shale dust;

enhancing dedusting of said dust-laden stream and substantially stabilizing and limiting polymerization of said dust-laden product stream by injecting a hydrogen donor quench into said dust-laden product stream;

separating a fraction of shale oil containing said hydrogen donor quench and from substantially greater than 1% to about 70% by weight oil shale dust from said hydrogen donor quenched product stream; and

dedusting said fraction.

4,536,279
ENHANCED RECOVERY OF HYDROCARBONACEOUS FLUIDS FROM OIL SHALE

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1984, Ser. No. 572,040
Int. Cl.³ C10G *1/00, 1/04*
U.S. Cl. 208—11 R **21 Claims**

1. A method for recovering hydrocarbonaceous fluids from oil shale containing organic carbon material, which comprises:

(a) heating the oil shale in a retort vessel at ambient pressure to a temperature at which thermal decomposition of the organic carbons contained in said oil shale is initiated;

(b) introducing into the retort a sufficient quantity of oil, for enhancement of carbon conversion, which oil does not substantially distill at a temperature below said initial decomposition temperature or below the temperature for maximum organic carbon conversion of said oil shale, while heat is applied to the retort vessel to increase the temperature to about 410°–425° C. wherein the highest amount of organic carbon conversion to hydrocarbonaceous liquids is obtained;

(c) holding the temperature for a period of time sufficient to allow substantial conversion of organic carbon material; and

(d) increasing the temperature to retorting temperatures and recovering the resultant hydrocarbonaceous fluids including oil introduced in step (b).

4,536,280

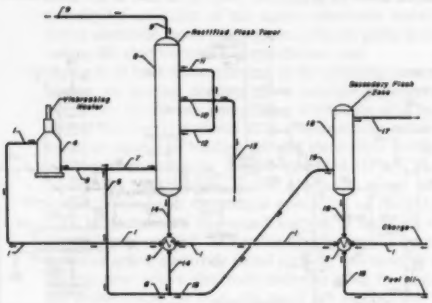
VISBREAKING PROCESS

John B. White, Jr., Mt. Prospect; Robert E. McHarg, Arlington Hts., and Frank Stolfa, Park Ridge, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 19, 1983, Ser. No. 563,327

Int. Cl.[3] C10G 9/00

U.S. Cl. 208—106 **6 Claims**



1. A method of thermally processing a hydrocarbon stream which comprises the steps of:

(a) heating a feed stream, which comprises a mixture of hydrocarbons having boiling points above 600° F., by indirect heat exchange against a hereinafter characterized first bottoms stream;

(b) passing the feed stream through a visbreaking zone, and admixing a resultant visbreaking zone effluent stream with a relatively high temperature quench stream having a temperature of above 600° F. to form a first process stream wherein the flow rate of the quench stream is greater than the flow rate of the visbreaking effluent stream;

(c) separating the first processor stream in a first separation zone into the desired hydrocarbon fractions including the previously referred to first bottoms stream;

(d) employing the first bottoms stream in said indirect heat exchange and then dividing the first bottoms stream into at least said quench stream and a second process stream; and,

(e) passing the second process stream into a second separation zone, and recovering a product stream from the second separation zone.

4,536,281

LARGE PORE CATALYSTS FOR HEAVY HYDROCARBON CONVERSION

William P. Hettinger, Jr., Russell, Ky., and James E. Lewis, Dublin, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 318,186, May 5, 1981, Pat. No. 4,431,749. This application Aug. 16, 1983, Ser. No. 523,811

Int. Cl.[3] C10G 11/02, 47/02

U.S. Cl. 208—113 **5 Claims**

1. A process for the catalytic conversion of a hydrocarbon feedstock containing at least ten percent heavy hydrocarbon components boiling above 1025° F., said process comprising contacting said feedstock with a catalyst,

wherein said catalyst is characterized by an increased percentage of feeder pores having an average diameter in the size range of about 100 to 6000 Å which results from admixing carbon black composed of primary reticulated particles having a length of about 500 to 30,000 Å, a carbon black dispersant and a shapeable catalyst composition having hydrocarbon conversion characteristics, wherein during said admixing controlling the agglomeration of the primary reticulated carbon black particles by the amount and dispersing effectiveness of said dispersant, to provide increased percentages of feeder pores in the range of about 100 to 6,000 Å, shaping said catalyst composition into solid shapes of hydrocarbon conversion catalyst containing 1 to 35 weight percent of said carbon black, and heating said catalyst shapes in the presence of an oxygen-containing gas at combustion conditions sufficient to remove said carbon black particles and provide large feeder pores of 100 to 6,000 Å in said solid catalyst, in a reaction zone maintained under hydrocarbon conversion conditions providing hydrocarbon conversion products and depositing coke on said catalyst, stripping said hydrocarbon conversion products from said catalyst, regenerating said catalyst under oxidizing conditions sufficient to remove at least a portion of said deposit of coke from said catalyst, and returning said regenerated catalyst to said reaction zone.

4,536,282

UPGRADING HEAVY CRUDE OILS TO LIGHTER PRODUCTS WITH A DISPERSED ZEOLITE

Louis D. Rollmann, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 509,829, Jun. 30, 1983, abandoned, which is a continuation-in-part of Ser. No. 378,143, May 14, 1982, abandoned. This application Jun. 4, 1984, Ser. No. 616,883

Int. Cl.[3] C10G 11/05

U.S. Cl. 208—120 **5 Claims**

1. A process for catalytically upgrading a heavy waxy hydrocarbon oil feed without prior hydrodenitrogenation of said feed, which process comprises the following steps:

(a) separably dispersing in 100 parts by weight of said feed from about 0.02 up to about 10 parts by weight of a virgin particulate catalyst comprising crystalline zeolite having a silica to alumina ratio of at least 12 and a Constraint Index of 1 to 12;

(b) maintaining said dispersion in a reaction zone at a temperature of 550° F. to 1050° F. and a pressure of 0 to 75 psig for a time effective to convert at least about 10 wt% of said heavy feed to more volatile liquid hydrocarbons and removing said more volatile hydrocarbons from said reaction zone whereby forming a residue comprising partially deactivated catalyst separably dispersed in refractory oil;

(c) separating said partially deactivated catalyst from said refractory oil;

(d) repeating steps (a), (b) and (c) including adding in step (a) all of said separated catalyst from previous step (c) until said dispersion in said reaction zone contains about 35 parts by weight of partially deactivated catalyst; and then

(e) removing from said process sufficient separated catalyst to maintain a preselected activity or selectivity and a total catalyst content not exceeding about 35 parts per weight per hundred parts by weight of said feed in said reaction zone.

4,536,283

INTEGRATED PROCESS FOR DEASPHALTING HEAVY OILS USING A GASEOUS ANTISOLVENT

Thomas A. Davis, Annandale, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 20, 1984, Ser. No. 642,501

Int. Cl.[3] C10C 3/00, 3/08

U.S. Cl. 208—309 **20 Claims**

1. A process for separating a liquid feedstream comprising a solvent selected from the group consisting of propane, butane, isobutane, pentane, isopentane, neopentane, hexane, 2-methyl pentane, 3-methyl pentane, 2-ethyl butane, heptane, 2-, 3-methyl hexane, or 3-ethyl pentane and a deasphalted oil containing aromatics and saturates comprising the steps of:

introducing a sufficient amount of a gaseous expansion gas into said liquid feedstream to cause it to form an upper liquid phase and a lower phase comprising aromatics,

separating the upper liquid phase from the lower liquid phase, and

flashing said separated upper liquid phase to produce an expansion gas phase, a second upper liquid phase comprising solvent, and a second lower liquid phase comprising saturates.

4,536,284

CLASSIFIER

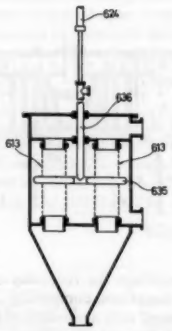
Toshio Furukawa, Chiba, Japan, assignor to Kikkoman Corporation, Chiba, Japan

Division of Ser. No. 358,371, Mar. 10, 1982, Pat. No. 4,461,702. This application Apr. 23, 1984, Ser. No. 603,163

Claims priority, application Japan, Mar. 16, 1981, 56-37615

Int. Cl.³ B07B *1/20*

U.S. Cl. 209—305 **8 Claims**



1. A classifier for separating particulate matter into relatively coarse and fine particles, comprising:

a casing adapted to permit said particulate matter to flow therein along a predetermined direction;

said casing including at least one inlet port, at least one course particle outlet port, and at least one fine particle outlet port, said ports being separated from each other;

at least one cylindrical screen assembly stationarily mounted in said casing, said cylindrical screen assembly including a cylindrical screen extending substantially axially along said predetermined direction so as to force the fine particles to traverse said cylindrical screen so as to be separated from the coarse particles;

said inlet port of said casing communicating with the interior of each said screen through an upper opening thereof, said coarse particle outlet port of said casing communicating with the interior of each said screen through a lower opening thereof, and said fine particle outlet port of said casing communicating with the interior of said screen through the mesh of said screen;

at least one air purge pipe disposed in said casing and connected to a source of compressed air, said air purge pipe having an opening facing the outer surface of said cylindrical screen assembly so as to blow particles off said screen assembly to prevent clogging thereof;

said air purge pipe being separated from said screen assembly such that said opening of said air purge pipe is spaced a predetermined distance from the surface of said cylindrical screen, said predetermined distance between said opening of said air purge pipe and said surface of said cylindrical screen being constant;

said air purge pipe being in the form of an annular tube; and

drive means for moving said air purge pipe along the length of said cylindrical screen so that the entire surface area of said screen may be exposed to said blowing by said air purge pipe.

4,536,285

ASSEMBLY COMPRISING A VORTEX FLUIDIC DEVICE FOR SEPARATING A MIXTURE OF A LIQUID PHASE AND A RELATIVELY HEAVY, SOLID PHASE

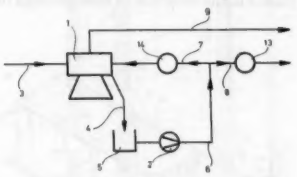
Per G. Karlsson, Stockholm, Sweden, assignor to Alfa-Laval Separation AB, Tumba, Sweden

Filed May 21, 1984, Ser. No. 612,374

Claims priority, application Sweden, May 27, 1983, 8302991

Int. Cl.³ B01D *43/00*; B04B *13/00*

U.S. Cl. 210—96.1 **3 Claims**



1. In an assembly comprising a centrifugal separator having an inlet for a mixture of a liquid phase and a relatively heavy phase, the separator having a first outlet for a separated liquid phase fraction and a second outlet for a separated heavy phase fraction, the assembly also comprising a recirculation line, means for returning to the centrifugal separator through said line at least part of the heavy phase fraction discharged from said second outlet, and a discharge line for heavy phase fraction discharged from said second outlet but not returned to the separator, the improvement which comprises a vortex fluidic device in said discharge line for controlling the flow therethrough, said vortex device having an inlet and an outlet for discharging all the heavy phase fraction entering said last inlet, said vortex device being of the type in which the flow rate therethrough increases with increasing viscosity of the flowing material and vice versa, said assembly being operable through said vortex device to reduce the return rate of heavy phase fraction to the separator in response to an increase in the viscosity of the separated heavy phase fraction from said second outlet of the separator and vice versa.

4,536,286

MOBILE WASTE WATER AND SLUDGE TREATMENT FOR HAZARDOUS AND NON-HAZARDOUS FLUIDS

James E. Nugent, Lafayette, La., assignor to Water & Industrial Waste Laboratories, Inc., Lafayette, La.

Continuation-in-part of Ser. No. 544,520, Oct. 24, 1983, which is a continuation of Ser. No. 357,789, Mar. 12, 1982, which is a continuation of Ser. No. 119,815, Feb. 8, 1980, abandoned. This application Dec. 9, 1983, Ser. No. 559,964

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.³ C02F *1/52*; B01D *21/08*

U.S. Cl. 210—202 **1 Claim**

1. A self-contained transportable waste treatment apparatus comprising:

a. an elongated, transportable, structural sled;

b. a pair of mixing tanks mounted at one end of the sled for mixing a liquid volume contained therein, at least one of the mixing tanks having a flow inlet discharging into the bottom thereof, a hollow tube disposed vertically within the tank and surrounding the inlet, and means for circulating fluid into the tube so that it discharges from the top of the tube and then circulates around the outside of the tube in a direction which returns the fluid into the bottom of the tube to an area adjacent said inlet;

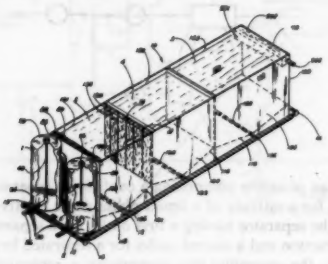
c. means for supplying a waste stream containing a chemical enhancing the formation of floc to the mixing tanks through said flow inlet;

d. a generally rectangular settling tank supported on the sled and defined by a plurality of walls extending up from the peripheral edge portion of the sled;

e. conduit means connecting the mixing tanks with the settling tank for supplying supernatant liquid from the mixing tanks to the settling tank;

f. means within the mixing tanks for recirculating fluid within the mixing tank;

g. a plurality of vertically disposed sections with small spaces therebetween forming a baffle structure extending from the top to the bottom of said settling tank that is placed interiorly of the settling tank and generally transversely placed to the direction of flow through the settling



tank and dividing the settling tank into at least primary and secondary sectors, said spaces allowing fluid flow therethrough and between the primary and secondary sectors to maintain a constant fluid level in said settling tank while enhancing floc size and solids deposition; and

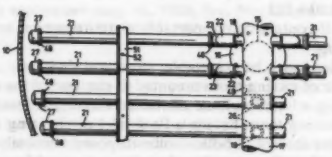
h. multiple sludge drawoff means supported by the sled and including multiple sections disposed at the lower portion of the settling tank respectively in the primary and secondary sectors thereof, each sector thereof being formed by two planar surfaces sloped toward the mid portion of each sector, and the upper portion of each planar surface intersecting respectively a side wall of that sector and a baffle, the lower portions of each planar surface communicating with a drain channel for removing settled solid material from the primary and from the secondary sectors of the settling basin in a lateral direction with respect to the direction of flow of fluid through the settling tank.

4,536,287

PIPING FOR USE IN LIQUID COLLECTION AND DISTRIBUTION

Alexander Himsley, Toronto, and John A. Bennett, Queensville, both of Canada, assignors to Himsley Engineering Limited, Toronto, Canada

Filed Apr. 18, 1984, Ser. No. 601,781
Int. Cl.³ B01D *23/20*
U.S. Cl. 210—293 **13 Claims**



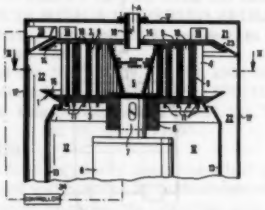
1. Piping for use in liquid collection and distribution comprising in combination an extruded pipe having in cross-section an interior opening and on one side a pair of outwardly projecting spaced arms each having a re-entrant lip adjacent its outer end, thereby forming a support channel with re-entrant sides extending along the pipe, and at least one channel-section strainer member adapted to be slid endwise longitudinally into the support channel with each side of the channel of the strainer member being received snugly between the lip of a respective support channel side and the outer surface of the pipe and the bottom of the channel-section strainer bridging between the support channel sides and being formed with strainer perforations.

4,536,288

POCKET CENTRIFUGE AND METHOD OF OPERATING SAME

Günther Hultsch, Oberschleissheim, Fed. Rep. of Germany, assignor to Krauss-Maffei AG, Munich, Fed. Rep. of Germany

Division of Ser. No. 126,359, Mar. 3, 1980, abandoned. This application Jul. 6, 1984, Ser. No. 628,325
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908455
Int. Cl.³ B01D *33/02*
U.S. Cl. 210—325 **5 Claims**



1. A pocket centrifuge for receiving a suspension and extracting a filtrate therefrom, comprising:

a rotor body formed with a plurality of sieve pockets distributed around an axis and adapted to receive said suspension means;

means for rotating said body about said axis to extract a filtrate from said suspension whereby sieve angles are formed between perforated surfaces of said pockets and solids retained on said surfaces which are less than the friction angle of said solids on said surfaces, said pockets being elongated and having innermost and outermost edges delimiting said surfaces;

means defining an eccentric axis for said body offset from the first-mentioned axis and located inwardly of the innermost edges of said pockets; and

means for orbiting said first-mentioned axis about said eccentric axis while continuing to rotate said body about said first-mentioned axis to cyclically increase the sieve angle of said solids on said surfaces to a magnitude greater than said friction angle whereby said solids are cast off from said surfaces only upon the orbiting of said first-mentioned axis about said offset axis and only from the radially outermost edges of said pockets.

4,536,289

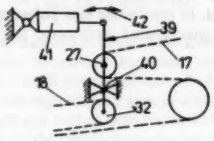
FILTER PRESS FOR DEWATERING OF MATERIALS

Robert Wolkenstein, Liezen, Austria, assignor to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Oct. 17, 1983, Ser. No. 542,607
Claims priority, application Austria, Oct. 18, 1982, 3829/82
Int. Cl.³ B01D *33/04*
U.S. Cl. 210—401 **6 Claims**

1. Filter press for dewatering of materials, in which the material to be dewatered is passed between two water-permeable sieve belts or filter belts over dewatering drums and is subjected to pressure by the tension of the water-permeable belts, the material to be dewatered being supplied onto one of

said water-permeable belts, the dewatered material being dumped at a location located downstream the dewatering drums as seen in travel direction and said water-permeable belts being separately guided between the dumping location and a supply area, characterized in that each of the sieve belts is separately passed over a respective tensioning roll which is adjustable in transverse direction to its axis by being supported



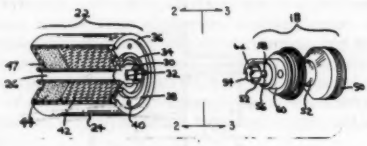
in bearings which are mechanically coupled to each other and guided in the direction of adjusting movement, the adjusting movement of said tensioning rolls being effected by a lever arm mechanically connected at spaced-apart locations to said bearings and pivotally mounted at a location between said spaced-apart locations and a piston and cylinder unit acting on said lever arm.

4,536,290

WATER FILTRATION DEVICE

Robert Bonazzo, 27 Bonazzo Dr., Trumbull, Conn. 06883

Filed Feb. 14, 1984, Ser. No. 579,984
Int. Cl.³ B01D *29/24*
U.S. Cl. 210—419 **6 Claims**



1. A water filtration device comprising:

first and second like hollow elongated members, each member having a small opening in one end and a large opening in the other end, the large openings in both members being adapted for detachable engagement with each other, said members when engaged defining an elongated housing having a cylindrically shaped central section and opposite upper and lower ends with small openings therein;

a single cylindrically shaped filter disposed removably in said central section, said filter having an axial bore aligned with the axis of said section, said housing end openings being centered on said axis, the ends of said filter disposed transversely to said axis having openings spaced from said bore;

first means secured to the opening in the upper housing end and detachably securable to the discharge port of a water faucet to secure said upper housing end in a rotationally pivotable manner to the port and to conduct water downwardly from the port into the housing; and

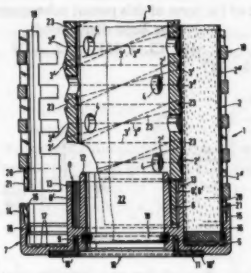
second means in the housing and connected between the first means and the bore, said second means having a first position with respect to said housing at which the conducted water flows downwardly through said bore and out of the lower end of the housing in unfiltered state and having a second position at which the water flows through the openings in the filter end adjacent the first means spaced from the bore, the filter, the openings in the opposite filter end spaced from the bore and out of the lower end of the housing in filtered state, the second means being placed in the first position when the housing is rotated in one direction about the first means and being placed in the second position when the housing is rotated in opposite direction about the first means.

4,536,291

TUBULAR FILTER ELEMENT WITH MATED END CAPS

Jürgen Hoffmann, Diemarden; Günter Pradel, Göttingen, and Fritz Reulecke, Adelebsen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,532
Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318940
Int. Cl.³ B01D *27/08, 29/14*
U.S. Cl. 210—457 **10 Claims**



1. A tubular filter means for filtration of a fluid, comprising: a filter sheet, wherein said sheet is folded and disposed into a cylindrical like-shape whereby the fold edges extend axially, a cylindrical support core having a plurality of perforations, the filter sheet is disposed outside of the cylindrical support core, at least one annular cap positioned at the end of the filter sheet and the cylindrical support core, the filter sheet is sealingly affixed to the cap, the cap is provided with two concentric inwardly axially extending spaced walls, the outer most concentric spaced wall is provided with inwardly extending axially oriented corrugations, the cylindrical support core is provided with an end portion which is embraced between the two concentric spaced walls and which is provided with outwardly extending axially oriented corrugations that mate with the inwardly extending corrugations of the outer concentric spaced wall, these corrugations preventing rotation of the cylindrical support core while also permitting axial expansion and contraction of the support core in relation to the annular cap.

4,536,292

CARBOXYLIC/SULFONIC/QUATERNARY AMMONIUM POLYMERS FOR USE AS SCALE AND CORROSION INHIBITORS

Gary F. Matz, Revere, Mass., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Mar. 26, 1984, Ser. No. 592,769
Int. Cl.³ C02F *5/12*
U.S. Cl. 210—701 **2 Claims**

1. A process for inhibiting the formation and deposition of scale in aqueous systems, said scale including calcium carbonate, calcium sulfate or calcium phosphate, and mistures thereof, comprising adding to the system at least 0.1 ppm of a water-soluble polymer having an intrinsic viscosity of 0.05 to 0.5 dl/g, prepared from:

(a) 60 to 75%, by weight, of an unsaturated carboxylic compound selected from the group consisting of acrylic acid, methacrylic acid and their salts;

(b) 5 to 25%, by weight, of an unsaturated sulfonic compound selected from the group consisting of 2-acrylamido-2-methylpropyl sulfonic acid, 2-methacrylamido-2-methylpropyl sulfonic acid and their salts; and

(c) 10 to 25%, by weight, of an unsaturated quaternary ammonium compound selected from the group consisting

of dimethyl diallyl ammonium chloride and diethyl diallyl ammonium chloride.

4,536,293

METHOD OF TREATING WASTE WATER

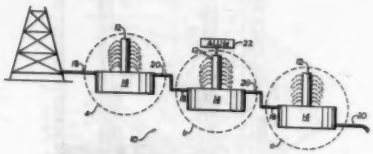
David Babineaux, III, P.O. Box 103, Payne, La. 70578

Continuation of Ser. No. 280,059, Jun. 30, 1981, abandoned, which is a continuation of Ser. No. 94,755, Nov. 15, 1979, abandoned, which is a continuation of Ser. No. 15,416, Feb. 26, 1979, abandoned. This application Nov. 19, 1981, Ser. No. 323,052

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.[3] **C02F** *1/52, 1/74*

U.S. Cl. 210—717 **2 Claims**



1. A method of purifying and treating waste water from oil and gas well drilling operations to improve the quality of the water sufficiently to allow the water to meet environmental standards, said waste water containing impurities comprising chlorides, suspended solids, dissolved solids, and oil or grease comprising the following steps:

(a) providing a sedimentation tank having an aerator feed pipe, a pump, a spray aerator, positioned in and above the tank, and a discharge pipe;

(b) pumping said waste water from oil and gas well drilling operations into said aerator feed pipe with said pump;

(c) adding an effective amount of a flocculent to said waste water from oil and gas well drilling operations ahead of said pump so that said flocculent is mixed and agitated along with said waste water, said flocculent reacting with minerals contained in said waste water to form a flocculent precipitate which aids in coagulating said impurities and settling out said impurities from said waste water after said waste water discharged from said pump;

(d) aerating and contacting said waste water containing said flocculent with air by spraying said waste water pumped from said aerator feed pipe through the atmosphere with said spray aerator, and permitting the aerated waste water to recollect in said sedimentation tank,

(e) collecting and holding said waste water for a time sufficient for said flocculent to react with minerals contained in said waste water to form said flocculent precipitate, and coagulating and settling out said impurities from said waste water, and (f) skimming clear waste water from the top of said sedimentation tank into said discharge pipe.

4,536,294

POLYMERIC FLOCCULANTS

James E. Guillet, 31 Sagebrush La., Don Mills, Ontario, M3A 1X4; Michael Heskins, 184 St. Germaine Ave., Toronto, Ontario, M5M 1W1, and D. Gary Murray, Apt. 304, 1325 York Mills Rd., Don Mills, Ontario, M3A 1Z6, all of Canada

Filed Mar. 23, 1983, Ser. No. 477,908

Claims priority, application Canada, Mar. 23, 1982, 399215

Int. Cl.[3] **C02F** *1/56;* **B01D** *21/01*

U.S. Cl. 210—730 **13 Claims**

1. A process for accelerating the rate of settling of a suspended, finely divided solids material from aqueous suspension using a polymeric flocculant of molecular weight at least 0.5×10^6 g/mol and which has a critical flocculation temperature in the approximate range 0° C.–80° C., said critical flocculation temperature being the temperature below which the polymeric flocculant exhibits flocculating ability and above which the polymeric flocculant will not effect flocculation, which comprises adding to said suspension an effective amount of the polymeric flocculant at a temperature below the critical flocculation temperature of the flocculant, said flocculant comprising at least one water soluble polymer of at least 50 mol% of N-isopropylacrylamide or N-isopropylmethacrylamide, or methyl cellulose, separating the settled solids material from the aqueous liquid, then warming the liquid to a temperature above the critical flocculation temperature of the polymeric flocculant, to precipitate said polymeric flocculant, and separating the precipitated polymeric flocculant from said aqueous liquid.

4,536,295

METHOD FOR SEPARATING COARSE PARTICLES FROM A LIQUID

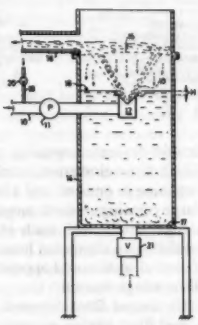
Bengt G. Janson, Djursholm, Sweden, assignor to AB Spray Technics S.T., Tranas, Sweden

Filed Oct. 13, 1983, Ser. No. 541,736

Claims priority, application Sweden, Oct. 20, 1982, 8205961

Int. Cl.[3] **B07B** *1/04*

U.S. Cl. 210—804 **3 Claims**



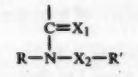
1. A method of separating coarse particles from a liquid by the liquid being pumped to a nozzle disposed in a vertical container, said nozzle spraying the liquid upwards in the form of a liquid cone against the underside of a horizontal screening means, such that the coarse particles fall back down into the container, while finer particles pass through the screening means together with the liquid and are taken off as a fine fraction, a liquid level in the container being caused to maintain a substantially constant level, characterized in that the whole of the liquid quantity supplied through the nozzle per time unit during continuous operation is led off through the screening means, and in that during continuous operation the liquid level in the container is caused to remain at a substantially constant height above an outlet orifice of the nozzle but below said screening means, such that a conical liquid jet is sprayed through a layer of the liquid in the container before reaching said screening means, the liquid in the vicinity of the nozzle being entrained in the liquid jet so that a larger amount of liquid is sprayed up toward the screening cloth than is supplied through the nozzle.

4,536,296
DRILLING AND COMPLETION MUDS USEFUL AT ELEVATED TEMPERATURES

Lino Vio, Pau, France, assignor to Societe Nationale Elf Aquitaine, Courbevoie, France

Continuation-in-part of Ser. No. 233,640, Feb. 12, 1981, abandoned. This application Mar. 10, 1983, Ser. No. 474,719
Claims priority, application France, Feb. 14, 1980, 80 03261; Jan. 16, 1981, 81 00767
Int. Cl.³ C09K 7/02
U.S. Cl. 252—8.5 C **15 Claims**

1. A clay based aqueous drilling or completion mud comprising clay, density increasing material, viscosity increasing agent, and from 1 to 10 grams per liter of a hydrosoluble polymeric material having pendant groups and a weight average molecular weight not higher than about 40,000, wherein from about 2 to 95% of the pendant groups are independently hydroxamic or thiohydroxamic groups of the formula:



wherein X_1 and X_2 are independently oxygen, or sulfur and R and R′ are independently hydrogen, alkyl or cycloalkyl having from 1 to about 18 carbon atoms, alkylene and cycloalkylene having from about 2 to 18 carbon atoms, aryl, alkylaryl, arylalkyl, alkoxyaryl, and alkoxyalkyl, having up to two conjugated rings, and having up to about 18 carbon atoms and wherein said polymeric material before the introduction of the hydroxamic or thiohydroxamic groups, is a homopolymer of acrylamide, methacrylamide, alkylacrylamide, thioacrylamide, alkylthioacrylamide, and hydroxyalkylacrylates, or copolymers of a monomer selected from acrylamide, methacrylamide, alklyacrylamide, thioacrylamide, alkylthioacrylamide, and hydroxyalkylacrylates and a monomer selected from acrylic acid, alkylacrylic acid, salts of acrylic acid and alkylacrylic acid, esters of acrylic acid and alkylacrylic acid, maleicanhydride, vinylacetate, vinyl pyrrolidone, butadiene, styrene and acrylonitrile.

4,536,297
WELL DRILLING AND COMPLETION FLUID COMPOSITION

Royal E. Loftin, and Adelina J. Son, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 343,620, Jan. 28, 1982, Pat. No. 4,440,649. This application Jan. 19, 1984, Ser. No. 572,103
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.
Int. Cl.³ C09K 7/02
U.S. Cl. 252—8.5 C **2 Claims**

1. A well drilling and completion fluid composition comprised of:

water;

sepiolite clay viscosity increasing agent present in said composition in an amount in the range of from about 1 to about 50 pounds per barrel of composition;

vinylamide-vinylsulfonate terpolymer fluid loss reducing and rheology stabilizing agent prepared by the reaction of 2-acrylamide-2 methyl-3-propyl sodium sulfonate, vinylacetamide and acrylamide monomers and mixtures thereof present in said composition in an amount in the range of from about 1 to about 30 pounds per barrel of composition;

sodium hydroxide present in said composition in an amount in the range of from about ¼ to about 2 pounds per barrel of composition; and

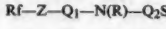
a clay stabilizing agent comprising at least one member selected from the group consisting of ammonium acetate, ammonium formate, and potassium formate present in said composition in an amount in the range of from about 1 to about 100 pounds per barrel of composition.

4,536,298
AQUEOUS FOAM FIRE EXTINGUISHER

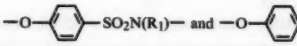
Masayuki Kamei, Urawa; Tomio Endo, Takasaki, and Yutaka Hashimoto, Urawa, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo and Kawamura Institute of Chemical Research, Saitama, both of, Japan

Filed Mar. 30, 1983, Ser. No. 480,213
Int. Cl.³ A62D 1/04; A62C 1/12
U.S. Cl. 252—8.05 **12 Claims**

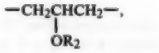
1. An aqueous foam fire extinguisher comprising (A) a fluorine-containing aminosulfonate-type surface-active agent of formula (A-2)



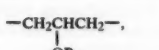
wherein Rf represents a fluorinated aliphatic group having 3 to 20 carbon atoms, Z is a divalent linking group selected from the group consisting of $—SO_2N(R_1)—$, $—CON(R_1)—$, $—(CH_2CH_2)_i—SO_2N(R_1)—$,



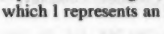
in which R_1 represents a hydrogen atom or an alkyl group having 1 to 12 carbon atoms, and i represents an integer of 1 to 10, Q_1 represents $(—CH_2)j$, in which j is an integer of 1 to 6 or



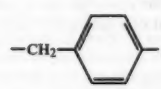
in which j is an integer of 1 to 6 or



in which R_2 represents an hydrogen atom or an alkyl group having 1 to 3 carbon atoms, R represents a hydrogen atom, an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, $—Q_2SO_3M$ or $—(CH_2)_kCOOM$, in which k represents an integer of 1 to 4, Q_2 represents $(—CH_2)_l—$ in which l represents an integer of 1 to 4,



in which R_3 represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, or



M represents a cationic atom or atomic grouping selected from the group consisting of a hydrogen atom, an alkaline earth metal and $—N(H)_m(R_4)_n$, in which R_4 represents an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, and m and n are integers of 0 to 4 provided that m+n=4, and (B) a cationic water-soluble polymeric substance which is a polyamine-type polymeric substance having a primary amino group, a secondary amino group, a tertiary amino group, an ammonium group, a pyridinium group or a quaternary ammo-

nium group in the main chain or side chain, the weight ratio of the component (B) to the component (A), B/A, being from 0.05 to 50.

4,536,299

PERFUMING WITH A MACROCYCLIC CARBONATE

Wilhelmus J. Wiegers, Red Bank, N.J.; Augustinus G. Van Loveren, Rye, N.Y.; Marie R. Hanna, Hazlet, N.J.; Domenick Loccarelli, Jr., Neptune, N.J.; David R. Bowen, Red Bank, N.J., and Manfred H. Vock, Locust, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 623,448, Jun. 22, 1984, , which is a division of Ser. No. 511,909, Jul. 8, 1983, Pat. No. 4,490,554. This application Nov. 14, 1984, Ser. No. 671,192

Int. Cl.[3] D06M *13/00*; C11D *3/50*

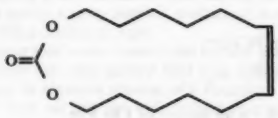
U.S. Cl. 252—8.6 3 Claims

1. A process for augmenting or enhancing the aroma of a musk perfumed article selected from the group consisting of:

(i) solid or liquid anionic, cationic, nonionic or zwitterionic detergents; and

(ii) fabric softener compositions or drier-added fabric softener articles

comprising the step of adding to said perfumed article an aroma augmenting or enhancing quantity of the compound having the structure:



4,536,300

MICELLAR SOLUTION FOR RECOVERING CRUDE OIL

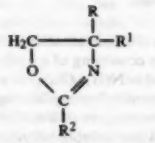
Robert B. Kayser, Evergreen, Colo., and Robert F. Purcell, Roselle, Ill., assignors to Angus Chemical Company, Northbrook, Ill.

Continuation-in-part of Ser. No. 284,766, Jul. 20, 1981, abandoned. This application Nov. 25, 1983, Ser. No. 555,284

Int. Cl.[3] E21B *43/22*

U.S. Cl. 252—8.55 D 7 Claims

1. In the process for recovering crude oil from a geological formation containing it using a micellar solution comprising a hydrocarbon, water, a petroleum sulfonate surfactant having an equivalent weight of about 350–500 and a co-surfactant, the improvement comprising using as the co-surfactant or portion thereof from 0.4 to 2.4% by weight of a substituted oxazoline represented by the formula



where R is ethyl or hydroxymethyl, R^1 is hydroxymethyl and the moiety R^2—C derives from oleic acid.

4,536,301

ENHANCED OIL RECOVERY

Thomas P. Malloy, Lake Zurich, and Raymond J. Swedo, Mount Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 297,910, Aug. 31, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 521,282

Int. Cl.[3] C09K *3/00*; E21B *43/22*

U.S. Cl. 252—8.55 D 10 Claims

1. In a process for an enhanced oil recovery wherein an aqueous surfactant slug is introduced into a subterranean reservoir of oil to displace said oil from said reservoir, said slug being in a sufficient amount to lower the interfacial tension between said oil and water, the improvement which comprises utilizing as said surfactant slug an aqueous mixture comprising:

(a) from about 1 to about 10% of a sulfonate of a mixture of mono- and dialkyl-substituted aromatic hydrocarbons prepared by the alkylation of an aromatic hydrocarbon with a straight or branched chain olefinic hydrocarbon containing from about 6 to about 22 carbon atoms in the chain in the presence of hydrogen fluoride at alkylation conditions;

(b) from about 1 to about 10% of a lower alkyl alcohol containing from about 3 to about 6 carbon atoms; and

(c) from about 0.1 to about 2% of a nonionic ethoxylated normal alcohol containing from about 12 to about 15 carbon atoms.

4,536,302

CORROSION INHIBITION OF AQUEOUS BRINES

John J. Augsburger, 128 Pamellia, Bellaire, and R. Keith Darlington, 719 Oder La., Houston, both of Tex.

Filed Jun. 30, 1983, Ser. No. 509,717

Int. Cl.[3] E21B *41/02*; C09K *3/00*; C23F *11/04*

U.S. Cl. 252—8.55 R 14 Claims

1. A method of reducing the corrosive affect of aqueous brine or ferrous metal surfaces exposed to said brine comprising adding to the brine a corrosion inhibiting quantity of a mixture of (1) a sulfur compound wherein the oxidation state of the sulfur is zero or less, said sulfur compound being employed in an amount of at least about 1.0 grams per liter of brine, and (2) a reducing sugar, said reducing sugar being employed in an amount of at least 1.0 grams per liter of brine, said mixture being generally uniformly dispersed in said brine.

4,536,303

METHODS OF MINIMIZING FINES MIGRATION IN SUBTERRANEAN FORMATIONS

John K. Borchardt, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

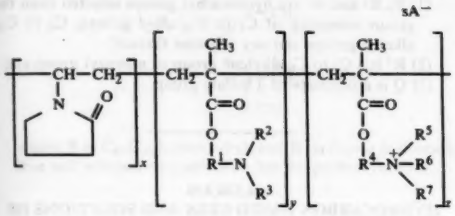
Filed Aug. 2, 1984, Ser. No. 636,942

Int. Cl.[3] E21B *43/12*, *43/25*, *43/27*

U.S. Cl. 252—8.55 R 19 Claims

1. A method of preventing or reducing the migration of fines in a permeable subterranean formation comprising:

contacting said fines in said permeable subterranean formation with an effective amount of an organic copolymer having recurring structural monomer units formed in a random fashion of the formula:



I II III

wherein

R^1 and R^4 are independently selected from the group consisting of an alkylene group having 1 to about 4 carbon atoms;

R^2, R^3, R^5, R^6, and R^7 are independently selected from the group consisting of methyl and ethyl;

A is selected from the group consisting of chloride, bromide, iodide, hydroxide, and methyl sulfate;

s is an integer equal to the number of said anions required to maintain electronic neutrality;

x, y, and z are integers, the sum of which equals the total number of monomer units in the copolymer required to give a molecular weight in the range of from about 100,000 to about 1,500,000; and

monomer unit I is present in the range of from about 80 to about 98 percent by weight of the copolymer;

monomer unit II is present in the range of from about 2 to about 20 percent by weight of the copolymer; and,

monomer unit III is present in the range of from about 0 to about 20 percent by weight of the copolymer.

4,536,304

METHODS OF MINIMIZING FINES MIGRATION IN SUBTERRANEAN FORMATIONS

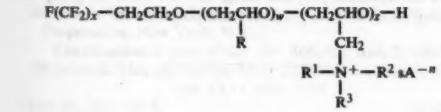
John K. Borchardt, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 21, 1984, Ser. No. 653,669

Int. Cl.[3] E21B *43/12, 43/25*

U.S. Cl. 252—8.55 R **19 Claims**

1. A method of preventing or reducing the migration of silica fines in a permeable subterranean formation comprising: contacting said fines in said permeable subterranean formation with an effective amount of a nitrogen-containing cationic perfluorinated compound or mixtures of said compound represented by the formula



wherein

R is selected from the group consisting of hydrogen, methyl, ethyl, propyl, and mixtures thereof;

R^1, R^2, and R^3 are independently selected from the group consisting of methyl, ethyl, and mixtures thereof;

A is selected from the group consisting of chloride, bromide, iodide, sulfate, methyl sulfate, and mixtures thereof;

x is an integer in the range of from about 2 to about 12 or an integer or a fraction of an integer representing an average value of from about 2 to about 12;

w is an integer in the range of from about 2 to about 20 or an integer or a fraction of an integer representing an average value of from about 2 to about 20;

z is an integer in the range of from 1 to about 20 or an integer or a fraction of an integer representing an average value of from 1 to about 20;

n represents the valency of the anion represented by A; and,

s is an integer equal to the number of said anions required to maintain electronic neutrality.

4,536,305

METHODS FOR STABILIZING SWELLING CLAYS OR MIGRATING FINES IN SUBTERRANEAN FORMATIONS

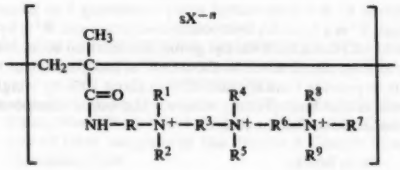
John K. Borchardt, and Bill M. Young, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 21, 1984, Ser. No. 653,668

Int. Cl.[3] E21B *43/12, 43/25*

U.S. Cl. 252—8.55 R **19 Claims**

1. A method of preventing or reducing the migration of fines or the swelling of clays or combinations thereof in a permeable subterranean formation comprising: contacting said fines or swelling clays or combinations thereof with an effective amount of an organic polycationic polymer having a molecular weight in the range of from about 50,000 to about 300,000 and having monomer units of the formula:



wherein

R and R^3 are independently an alkylene group having from about 2 to about 4 carbon atoms;

R^1, R^2, R^4, R^5, R^7, R^8, and R^9 are independently selected from the group consisting of methyl and ethyl;

R^6 is selected from the group consisting of an unsubstituted alkylene group having from about 2 to about 4 carbon atoms and a substituted alkylene group having from about 2 to about 4 carbon atoms and containing a hydroxy group;

X is an anion selected from the group consisting of a halogen, methyl sulfate, sulfate, and nitrate;

n represents the valency of the anion represented by X; and,

a is an integer equal to the number of said anions required to maintain electronic neutrality.

4,536,306

BORATED PHOSPHORUS-CONTAINING COMPOUNDS AND LUBRICANT COMPOSITIONS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,410

Int. Cl.[3] C10M *1/44, 1/54*

U.S. Cl. 252—32.7 E **27 Claims**

1. A product of reaction made by reacting a vicinal diol, a phosphorus oxyhalide and a boron compound, the vicinal diol being reacted with the phosphorus oxyhalide at a temperature between about 30° C. to about 220° C. in sufficient quantity so that about 5% to about 95% of the diol hydroxy functions are reacted, and the product thereby obtained being reacted with the boron compound at a temperature between about 80° C. and about 260° C. in sufficient quantity so that between about 5% and about 100% of the unreacted hydroxy functions are reacted, or the vicinal diol being reacted with the boron compound at a temperature between about 80° C. and about 260° C. in sufficient quantity so that about 5% to about 95% of the diol hydroxy functions are reacted, and the product thereby ob-

tained being reacted with the phosphorus oxyhalide at a temperature between about 30° C. and about 220° C. in sufficient quantity so that about 5% to about 100% of the unreacted hydroxy functions are reacted, all reactions being conducted at a pressure between about atmospheric and less than atmospheric pressure.

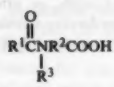
4,536,307

LUBRICANT COMPOSITION

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,139
Int. Cl.³ C10M *1/36*
U.S. Cl. 252—32.7 E **31 Claims**

1. A product of reaction made by reacting a boron compound with an acyl sarcosine of the formula



wherein R^1 is a hydrocarbyl group containing 1 to 20 carbon atoms, R^2 is a C_1 to C_6 hydrocarbylene group and R^3 is hydrogen or a C_1 to C_6 hydrocarbyl group, the reaction being carried out at from about 80°C. to about 260° c. using sufficient reactants to provide from about 0.02% to about 10% by weight of boron in the final product wherein the boron compound is boron oxide or has the formula

$$(RO)_x B(OH)_y$$

wherein R is a C_1 to C_6 alkyl group, x is 0 to 3 and y is 0 to 3, the sum of x and y being 3.

4,536,308

LITHIUM SOAP GREASE ADDITIVE

Rebecca C. C. Pehler; James R. Whiteman, both of Port Arthur, and Arnold C. Witte, Jr., Port Neches, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,286
Int. Cl.³ C10M *1/48, 1/54*
U.S. Cl. 252—32.7 E **9 Claims**

1. A grease composition comprising a major portion of a mineral lubricating oil, a grease thickening amount of lithium 12-hydroxystearate and an effective amount of an additive composition, basis the grease composition said additive composition consisting of 4 to 8 wt % sulfurized sperm oil substitute, 0.5 to 2.0 wt % of the reaction product of coconut oil and diethanolamine, 2.4 to 5.0 wt % of zinc dialkyldithiophosphate, 0.5 to 2.0 wt % zinc diamyldithiocarbamate and 0.5 to 1.0 wt % aromatic amine phosphate.

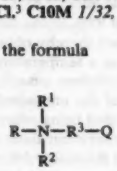
4,536,309

ZWITTERIONIC QUATERNARY AMMONIUM SULFONATES AND SULFATES AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 29, 1982, Ser. No. 403,264
Int. Cl.³ C10M *1/32, 1/38*
U.S. Cl. 252—33 **27 Claims**

1. A composition of the formula



wherein

(1) R, R^1 and R^2 are hydrocarbyl groups selected from the group consisting of C_1 to C_{30} alkyl groups, C_6 to C_{30} alkenyl groups and any mixtures thereof,

(2) R^3 is a C_2 to C_6 alkylene group or a benzyl group and

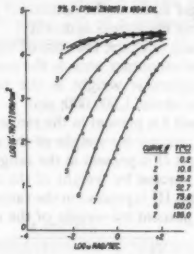
(3) Q is a sulfonate or a sulfate group.

4,536,310

HYDROCARBON BASED GELS AND SOLUTIONS OF BLENDS OF SULFONATE IONOMERS AND THEIR PRECURSORS EXTENDED OVER CRITICAL REGIONS

Pawan K. Agarwal, Westfield; Robert D. Lundberg, Bridgewater; William W. Graessley, Annandale, and Gay Ver Strate, Matawan, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 23, 1983, Ser. No. 565,157
Int. Cl.³ C10M *5/10, 5/22*
U.S. Cl. 252—33 **5 Claims**



1. A method for controlling the viscosity of hydrocarbon liquids havng a solubility parameter of less than about 9.5 and a viscosity of less than about 100 cps, said hydrocarbon liquid being selected from the group consisting of mineral oil, synthetic oil, lubricating oil, alkanes, cycloalkanes and aromatics and mixtures thereof, which comprises incorporating into said hydrocarbon liquid about 1 to about 15 grams/100 ml of said hydrocarbon liquid of a polymer blend, such polymer blend comprising a metal or amine neutralized sulfonated polymer and an unsulfonated polymer, said unsulfonated polymer comprising about 0.1 to about 35 weight percent of said polymer blend, such neutralized sulfonated polymer and said unsulfonated polymer each having the same polymeric backbone and said unsulfonated polymer being selected from the group consisting of EPDM terpolymers and polystyrene.

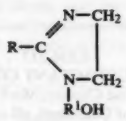
4,536,311

MULTIPURPOSE ANTIRUST AND FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

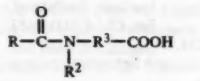
Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 566,086
Int. Cl.³ C10M *1/32, 1/36*
U.S. Cl. 252—51.5 A **18 Claims**

1. A product of reaction obtained by reacting a hydrocarbyl hydroxyalkyl imidazoline and an acyl sarcosine at temperatures of from about 90° to about 250° C. and at atmospheric or higher pressure in a molar ratio of imidazoline to sarcosine of from about 1:1 to about 1:3 wherein said imidazoline has the general formula

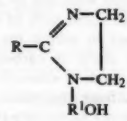


where R is C_8–C_{30} hydrocarbyl, and R^1 is C_2–C_4 hydrocarbylene and wherein said sarcosine has the general formula

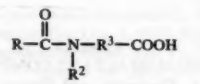


wherein R is as defined above, R^2 is C_1–C_6 hydrocarbyl or hydrogen and R^3 is C_1–C_6 hydrocarbylene.

7. A lubricant composition containing a major proportion of a lubricating oil or a grease prepared therefrom and a minor friction reducing or corrosion inhibiting amount of a product of reaction obtained by reacting a hydrocarbyl hydroxyalkyl imidazoline and an acyl sarcosine in a suitable solvent at temperatures of from about 90° to about 250° C. and at atmospheric or higher pressure in a molar ratio of imidazoline to sarcosine of from about 1:1 to about 1:3 and wherein said imidazoline has the general formula



where R is C_8–C_{30} hydrocarbyl and R^1 is C_2–C_4 hydrocarbylene, and wherein said sarcosine has the general formula



wherein R is as defined above, R^2 is C_1–C_6 hydrocarbyl or hydrogen and R^3 is C_1–C_6 hydrocarbylene.

4,536,312

SULFURIZED AMINE CONDENSATION PRODUCTS AND LUBRICANT COMPOSITIONS CONTAINING SAME

Gerassimos Frangatos, Haddonfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 366,953, Apr. 9, 1982, abandoned. This application Mar. 20, 1984, Ser. No. 591,648

Int. Cl.³ C10M *1/38*

U.S. Cl. 252—47.5 **12 Claims**

1. A sulfurized product obtained by the reaction of a hydrocarbyl amino substituted nitrogen heterocyclic compound with an unsaturated monocarboxylic acid of the formula:

RCOOH

wherein R is an alkenyl group, and alkedienyl group or an alketrienyl group containing from about 2 to about 50 carbon atoms in substantially stoichiometric amounts at a temperature of from about 150° to 275° C. to produce a product and thereafter sulfurizing said product with a substantially stoichiometric amount of elemental sulfur at a temperature of from about 150° to about 225° C.

10. A lubricant composition comprising a major proportion of a mineral lubricating oil, a synthetic lubricating oil or a grease from either of these, and a minor effective anti-rust amount of the product as defined in claim 1.

4,536,313

PEROXYGEN COMPOUND

Geoffrey J. Hignett, Lymm; Kenneth T. Rowbottom, and William R. Sanderson, both of Warrington, all of England, assignors to Interox Chemicals Limited, London, England

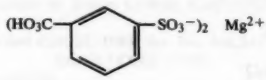
Filed Mar. 12, 1984, Ser. No. 588,817

Claims priority, application United Kingdom, Mar. 15, 1983, 8307037

Int. Cl.³ C11D *7/54, 3/395;* C07C *179/133, 133*

U.S. Cl. 252—100 **23 Claims**

1. In solid form, a salt, expressed in anhydrous form, having the general formula:



4,536,314

BLEACH COMPOSITIONS COMPRISING NON-LINEAR ALIPHATIC PEROXYCARBOXYLIC ACID PRECURSORS

Frederick E. Hardy, Newcastle upon Tyne, England; David J. Kitko, West Chester, and Cushman M. Cambre, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 22, 1984, Ser. No. 582,421

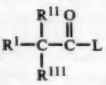
Claims priority, application United Kingdom, Feb. 23, 1983, 8304990

The portion of the term of this patent subsequent to Nov. 1, 2000, has been disclaimed.

Int. Cl.³ C11D *7/38, 7/54;* B32B *27/34*

U.S. Cl. 252—102 **39 Claims**

1. A non-linear aliphatic peroxycarboxylic acid precursor adapted to form a non linear aliphatic peroxy. acid in aqueous alkaline hydrogen peroxide solution wherein the precursor has the general formula:

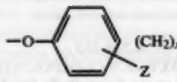


wherein the group:

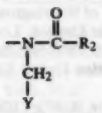
is an organic moiety of non linear structural configuration R^{II} and R^{III} being independently selected from the group consisting of hydrogen and C_1–C_4 alkyl groups, the group:

being the acyl moiety of a carboxylic acid having a log P_{oct} of from about 1.9 to about 4.1, wherein P_{oct} is the partition coefficient of the carboxylic acid between n-octanol and water at 21° C., and L is a leaving group selected from the group consisting of

(a)



(b)



wherein Z is selected from the group consisting of H, R_2 and halide, R_2 is an alkyl group containing from 1 to 4 carbon atoms, x is 0 or an integer from 1 to 4 and Y is selected from the group consisting of

—SO_3M
—OSO_3M
—CO_2M
—$N^+(R_2)_3Q^-$
—$N(R_2)_2 \rightarrow O$

wherein M is selected from the group consisting of H, alkali metal, alkali earth meal, ammonium and substituted ammonium and Q is a halide or methosulphate.

4,536,315

PERFUME-CONTAINING CARRIER HAVING SURFACE-MODIFIED PARTICLES FOR LAUNDRY COMPOSITION

Pallassanna Ramachandran, Robbinsville, and Paul S. Grand, Highland Park, both of N.J., assignors to Colgate Palmolive Co., New York, N.Y.

Filed Jun. 1, 1983, Ser. No. 499,927

Int. Cl.³ C11D *17/06, 1/38, 9/44;* **A61K** *7/46*

U.S. Cl. 252—174.11 **28 Claims**

1. A perfume-containing carrier consisting essentially of (i) discrete particles containing at least 90%, by weight, of a smectite-type clay and/or a zeolite; (ii) a perfume, said perfume being absorbed and/or absorbed on said particles; and (iii) a fabric-adhesive agent comprising at least one of an anionic detergent compound, a nonionic detergent compound, or a cationic compound selected from the group consisting of primary, secondary and tertiary amines and their water-soluble salts, diamine and diammonium salts, and quaternary ammonium, phosphonium and sulfonium compounds, said fabric-adhesive agent being in contact with said particles and forming at least a partial coating upon the surface thereof, the perfume-containing carrier containing less than about 5%, by weight, of surface active detergent compounds other than cationic detergents.

4,536,316

FABRIC SOFTENING COMPOSITION CONTAINING SURFACE MODIFIED CLAY

Pallassanna Ramachandran, Robbinsville, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

Filed Jun. 1, 1983, Ser. No. 499,928

Int. Cl.³ C11D *17/06, 7/22, 3/02;* **D06M** *13/00*

U.S. Cl. 252—174.11 **29 Claims**

1. A fabric softening composition for use in admixture with a particulate laundry detergent composition comprising: (i) discrete softening particles containing at least about 90%, by weight, of a smectite-type clay, and less than about 5%, by weight, of detergent surface active agents selected from the group consisting of anionic, nonionic, ampholytic, and zwitterionic detergents; and (ii) a cationic compound selected from the group consisting of primary, secondary and tertiary amines and their water-soluble salts, diamine and diammonium salts, and quaternary ammonium, phosphonium and sulfonium compounds, substantially all of said cationic compound being adsorbed upon the surface of said particles, the weight ratio of softening particles to cationic compound being from about 500:1 to about 10:1.

4,536,317

FOAMING SURFACTANT COMPOSITIONS

Ramon A. Llenado, West Chester; Mark H. K. Mao, and Denzel A. Nicholson, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 371,696, Apr. 26, 1982, abandoned. This application Jul. 12, 1982, Ser. No. 397,330

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.³ C11D *1/83*

U.S. Cl. 252—174.17 **3 Claims**

1. An agglomerated light-duty detergent granule composition comprising

(1) from about 5% to about 60% of an alkylpolysaccharide surfactant having the formula $RO(R^1O)_t(Z)_x$ where Z is a moiety derived from a reducing saccharide containing from 5 to 6 carbon atoms and wherein R is an alkyl, alkylphenyl, hydroxy alkylphenyl or hydroxyalkyl hydrophobic group or mixtures thereof in which said alkyl groups contain from about 8 to about 18 carbon atoms; R^1 contains from 2 to about 4 carbon atoms; t is from 0 to about 30; and x is a number from about 1.5 to about 10;

(2) from about 5% to about 60% of an alkyl benzene sulfonate cosurfactant in which the alkyl group contains from about 10 to about 13 carbon atoms, said alkyl benzene sulfonate neutralized with one or more cationic moieties;

(3) from about 5% to about 60% of an alkylpolyethoxylate sulfate cosurfactant in which the alkyl group contains from about 10 to about 16 carbon atoms and there are from about 1 to about 6 ethoxylate groups, said alkylpolyethoxylate sulfates neutralized with one or more cationic moieties;

(4) from about 5% to about 80% water soluble inorganic salt selected from the group consisting of sodium and potassium sulfates, chlorides, carbonates, phosphates, and mixtures thereof.

4,536,318

FOAMING SURFACTANT COMPOSITIONS

Thomas E. Cook, Cincinnati, and Ramon A. Llenado, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 371,694, Apr. 26, 1982, abandoned. This application Jul. 12, 1982, Ser. No. 396,999

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.³ C11D *1/74, 1/83*

U.S. Cl. 252—174.17 **7 Claims**

1. A foaming composition comprising from about 0.01% to about 95% of surfactants comprising

(1) an alkylpolysaccharide surfactant having the formula $RO(R^1O)_t(Z)_x$ where Z is a moiety derived from a reducing saccharide containing from 5 to 6 carbon atoms and wherein R is an alkyl, alkylphenyl, hydroxy alkylphenyl or hydroxyalkyl hydrophobic group or mixtures thereof in which said alkyl groups contain from about 8 to about 18 carbon atoms; R^1 contains from 2 to about 4 carbon atoms; t is from 0 to about 30; and x is a number from about 1.5 to about 10;

(2) a mixture of anionic cosurfactants neutralized with one or more cationic moieties consisting essentially of:

(a) from about 1% to about 95% of a water soluble alkylbenzene sulfonate in which the alkyl group contains from about 10 to.13 carbon atoms, and

(b) from about 5% to about 99% of a cosurfactant selected from the group consisting of an alkyl glyceryl ether sulfonate in which the alkyl group contained from about 8 to about 18 carbon atoms, an alpha-olefin sulfonate in which the olefin group contains from about 10 to

about 18 carbon atoms, an alkyl polyethoxylate carboxylate in which the alkyl group contains from about 10 to about 18 carbon atoms, and the polyethoxylate chain contains from about 2 to about 6 ethoxylate groups, and mixtures thereof, the ratio of (1) to (2) being from about 1:10 to about 10:1.

4,536,319

COMPOSITIONS COMPRISING ALKYLPOLYSACCHARIDE DETERGENT SURFACTANT

Nicholas S. Payne, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 4, 1983, Ser. No. 538,855

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.[3] C11D *1/72, 1/831*

U.S. Cl. 252—174.17 20 Claims

1. A homogeneous granular detergent composition comprising:

(1) from about 2% to about 30% of alkylpolysaccharide detergent surfactant having the formula $RO(R^1O)_tZ_x$ wherein R is an alkyl, alkylphenol, hydroxyalkyl, hydroxy alkylphenol, or mixtures thereof, and said alkyl groups contain from about 8 to about 18 carbon atoms; wherein each R^1 contains from 2 to about 4 carbon atoms; wherein t is from 0 to about 5; wherein Z is a moiety derived from a reducing saccharide containing from 5 to 6 carbon atoms; and wherein x is from about $1\frac{1}{2}$ to about 5;

(2) from 0% to about 30% of detergent cosurfactant;

(3) from about 10% to about 75% of water-soluble neutral or alkaline salt; and

(4) from about 5% to about 20% water.

4,536,320

NEMATIC LIQUID CRYSTALLINE COMPOSITION

Tsutomu Nishizawa, Yokohama; Ryoichi Tukahara, Mobara; Ryoichi Morinaka, and Tuneo Hidaka, both of Ohmuta, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

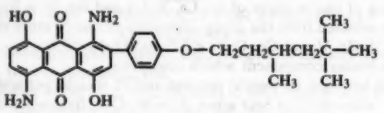
Continuation-in-part of Ser. No. 223,015, Jan. 6, 1981, abandoned. This application Oct. 5, 1983, Ser. No. 538,823

Claims priority, application Japan, Jan. 17, 1980, 80-3100[U]

Int. Cl.[3] C09K *3/34;* G02F *1/13*

U.S. Cl. 252—299.1 1 Claim

1. Nematic liquid crystalline composition comprising (i) at least one nematic liquid crystalline material, and (ii) dissolved in (i), the anthraquinonic dye compound of the formula:



4,536,321

FLUOROBENZENE DERIVATIVES AND LIQUID CRYSTAL COMPOSITIONS CONTAINING THE SAME

Shigeru Sugimori, Fujisawashi; Tetsuhiko Kojima, Yokohamashi; Yasuyuki Goto, Yokohamashi; Toyoshiro Isoyama, Yokohamashi, and Kazunori Nigorikawa, Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

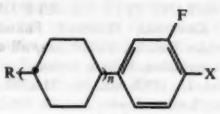
Filed Feb. 16, 1984, Ser. No. 580,628

Claims priority, application Japan, Feb. 18, 1983, 58-25689; Mar. 15, 1983, 58-42992; Mar. 28, 1983, 58-52179; Apr. 18, 1983, 58-68188

Int. Cl.[3] C09K *3/34;* G02F *1/13;* C07C *121/64, 49/807, 49/813*

U.S. Cl. 252—299.63 8 Claims

1. Fluorobenzene derivatives expressed by the general formula



(I)

wherein X represents CN or $COCH_3$ and n is 2 when X is CN and n is 1 or 2 when X is $COCH_3$, and R represents hydrogen atom or an alkyl group of 1–15 carbon atoms or an alkoxy group of 1 to 15 carbon atoms.

4,536,322

FLUORESCENT CORROSIVE FLUORIDE SOLUTION

Gary A. Amstutz, and Kishor D. Mayekar, both of San Jose, Calif., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 28, 1983, Ser. No. 546,543

Int. Cl.[3] C09K *11/06*

U.S. Cl. 252—301.16 14 Claims

1. An aqueous etchant solution comprising: a corrosive fluoride etchant component and a non-metallic, organic, normally colorless dye that fluoresces in the visible region when illuminated by ultra-violet light and which is non-reactive with the corrosive fluoride etchant component said dye being an organic dye having the general formula:

whose

$R_1 = NH_2$ or OH

$R_2 = C_1$–C_{18} alkyl or fluorosubstituted methyl

X=O or N.

4,536,323

NON-FLAMMABLE AEROSOL PROPELLANT MICROEMULSION SYSTEM

Howard R. Stopper, Cincinnati, Ohio, assignor to The Drackett Company, Cincinnati, Ohio

Filed Jun. 28, 1983, Ser. No. 508,643

Int. Cl.[3] C09K *3/30*

U.S. Cl. 252—305 21 Claims

1. A propellant composition for aerosol dispensers capable of forming, at pressures suitable for delivering an aerosol from the aerosol dispenser, an oil-in-water microemulsion, said aerosol being characterized by its suppressed flammability, the composition comprising (a) a mixture comprising by weight of the total weight of the composition from about 23 to about 35% of a water-immiscible liquid which is a solvent for the propellant, from about 15 to about 25% water, and from about 3 to about 20% of a mixed surfactant system of at least one primary and at least one secondary surfactant, and (b) at least about 30% by weight of the total weight of the composition of at least one normally gaseous flammable aerosol propellant provided to pressurize the aerosol dispenser, the propellant being soluble in the water-immiscible liquid, said mixed surfactant system having a hydrophilic-lipophilic balance sufficient to cause the water-immiscible liquid in which the propellant is dissolved to disperse as micro-droplets in the water upon shaking of the aerosol dispenser, the micro-droplets being separated from the continuous water phase by the mixed surfactant system.

4,536,324

NONIONIC SURFACTANT TYPE VESICLE DISPERSION

Masami Fujiwara, Kawasaki; Hidenori Fukuda, Minamiashigara, and Minako Tanaka, Yokohama, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jul. 18, 1983, Ser. No. 514,789
Claims priority, application Japan, Jul. 19, 1982, 57-125315
Int. Cl.[3] B01J *13/00*
U.S. Cl. 252—311 3 Claims

1. A nonionic surfactant type vesicle dispersion comprising vesicles, dispersed in an aqueous medium, composed of (A) 100 parts by weight of at least one ethoxylate selected from the group consisting of polyoxyethylene castor oil ethers and polyoxethylene hardened castor oil ethers having an average ethylene oxide addition mole number of 7 to 20 and (B) 3 to 30 parts by weight of sorbitan polyesters of long-chain fatty acids having 14 to 18 carbon atoms, and having the esterification degree of 2.5 to 3.5, wherein the total amount of components (A) and (B) is about 0.1% to 50% by weight based on the total weight of the dispersion.

4,536,325

PREPARATION OF STABLE OIL-IN-WATER EMULSIONS OF HIGH OIL CONTENT

Gerhard Borggrefe, Dusseldorf, and Christian Hase, Erkrath; both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 24, 1984, Ser. No. 573,521
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303174
Int. Cl.[3] B01J *13/00*
U.S. Cl. 252—314 2 Claims

1. A process for the preparation of stable oil-in-water emulsion containing from 70% to 95% of oily non-aqueous phase consisting of the steps of dissolving an emulsifier in the amount of water desired, adding the oily non-aqueous phase in one stage, mixing for one to two minutes in a high speed mixer and recovering the stable oil-in-water emulsion, employing from 0.1% to 3% by weight of the emulsion of at least one water-soluble salt of monoacyl cyanamide where said acyl is derived from fatty acids containing from 12 to 18 carbon atoms, as said emulsifier.

4,536,326

TREATMENT OF ACRYLAMIDE AND RELATED COMPOUNDS

Joseph M. Schmitt, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 362,351, Mar. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 258,235, Apr. 27, 1981, abandoned. This application Jan. 4, 1984, Ser. No. 570,403
Int. Cl.[3] C09K *15/32*; C08F *20/56, 20/06*
U.S. Cl. 252—400 R 12 Claims

1. A composition comprising:

(a) a monomer of inferior polymerizability selected from acrylamide, acrylic acid and mixtures thereof, said monomer being in the form of a 10 to 60 weight percent aqueous solution having a pH above 8.0, said monomer containing an amount of oxygen such that said monomer solution has a positive oxygen solubility, and

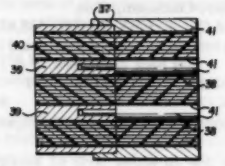
(b) a monomer-improving amount, insufficient to catalyze polymerization of said monomer, of an alkali metal borohydride.

4,536,327

COMPOSITION FOR PROTECTION AGAINST STRAY CURRENTS AND PROCESS FOR USING THE SAME

Yves D. Ramisse; Jean-Pierre C. Baboulet; Michel P. Vié, and Paul C. Malaval, all of Gramat, France, assignors to L'Etat Francais, France

Filed Jun. 8, 1981, Ser. No. 271,615
Claims priority, application France, Jun. 13, 1980, 80 13138
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—511 14 Claims



1. A composition for protecting electric cables, connectors, and connections, from parasitic currents, namely, noise currents from irradiation and X-ray photon pulses, comprising:

(a) a cold-curing silicone rubber of a viscosity of less than 10,000 centipoises;

(b) a filler of fine particles of carbon black of sizes of less than 1 micron in a percentage of 2 to 6% by weight, the fine filler carbon black particles having a specific surface of greater than 500 m^2/g; and

(c) a solvent for the silicone in a percentage of at least 40% by weight.

4,536,328

ELECTRICAL RESISTANCE COMPOSITIONS AND METHODS OF MAKING THE SAME

Dana L. Hankey, Exton, Pa., assignor to Heraeus Cermalloy, Inc., W. Conshohocken, Pa.

Filed May 30, 1984, Ser. No. 615,204
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—518 35 Claims

1. A composition for making electrical resistance elements comprising:

a. a conductive component which comprises a precious metal oxide of the formula $A'_{1-x}A''_xB'_{1-y}B''_yO_3$ wherein A' is Sr or Ba, when A' is Sr, A'' is selected from the group consisting of one or more of Ba, La, Y, Ca and Na, and when A' is Ba, A'' is selected from the group consisting of one or more of Sr, La, Y, Ca and Na; B' is Ru; B'' is selected from the group consisting of one or more of Ti, Cd, Zr, V and Co; $O<x<0.2$; and $O<y<0.2$;

b. a binder component which comprises

(i) between 40 weight percent and 75 weight percent C', wherein C' is SrO when A' is Sr, C' is BaO when A' is Ba, and C' is SrO+BaO when A' is Sr and A'' is Ba and when A' is Ba and A'' is Sr,

(ii) between 20 weight percent and 35 weight percent B_2O_3,

(iii) between 2 weight percent and 15 weight percent SiO_2, and

(iv) between 0.5 weight percent and 6.5 weight percent ZnO.

4,536,329

BOROSILICATE GLASS COMPOSITIONS

Jacob Hormadaly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1983, Ser. No. 562,965
Int. Cl.[3] C03C *3/08, 3/10*; H01B *1/06*
U.S. Cl. 252—518 5 Claims

1. A glass which is suitable for use as a binder in high end

resistors, which is substantially free of Bi, Cd and Pb and on a molar basis consists essentially of:

A. 50–85% of glass forming materials consisting of 25–55% B_2O_3, 15–40% SiO_2; 0–10% ZrO_2 and 0–5% SnO_2, and

B. 50–15% of glass modifying materials consisting of 10–30% BaO, 1–10% CoO and 0–12% oxides of alkaline earth metals having atomic numbers 12–38, providing that

(1) the mole ratio $B_2O_3/SiO_2 = \geqq 0.8$; and

(2) $\Sigma\ (B_2O_3 + SiO_2) \geqq 50$.

4. A printable thick film resistor composition comprising a dispersion in organic medium of an admixture of finely divided particles of

(a) 95–55% wt. tin oxide pyrochlore-based conductive phase and

(b) 5–45% wt. of the glass of claim 1 or the composition of claim 3.

4,536,330

1-HYDROXYMETHYL-2-ACYL CYCLOPROPANE DERIVATIVES AND ESTERS AND CYCLIC CONDENSATION PRODUCTS THEREOF, ORGANOLEPTIC USES OF SAME AND PROCESSES FOR PREPARING SAME

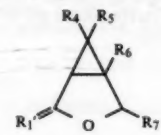
Richard M. Boden, Ocean; Marie R. Hanna, Hazlet, and Theodore J. Tyszkiewicz, Sayreville, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 541,275, Oct. 12, 1983, Pat. No. 4,500,448, which is a division of Ser. No. 422,486, Sep. 23, 1982, Pat. No. 4,435,428. This application Mar. 14, 1984, Ser. No. 589,510

Int. Cl.³ C11B *9/00*

U.S. Cl. 252—522 R **2 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein R_1' represents C_1–C_{10} alkylidene; and wherein R_4, R_5, R_6 and R_7 represent hydrogen or C_1–C_3 lower alkyl.

4,536,331

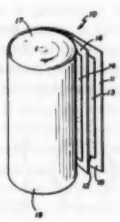
NON-TOXIC IMPREGNANT FOR ELECTRICAL CAPACITORS

Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 385,669, Jun. 7, 1982, abandoned. This application Oct. 27, 1983, Ser. No. 545,989

Int. Cl.³ H01B *3/22, 3/20*

U.S. Cl. 252—579 **3 Claims**



1. A dielectricimpregnating fluid used in a capacitor, the dielectric fluid including a refined low acid soybean oil having a flash point of about 325° C. a first additive of butylated hydroxyanisole in an amount of from about 0.05% to 10% by weight of the total weight of said dielectric fluid, and a second additive of an olefin taken from the class consisting of decene, dodecene, tetradecene, hexadecene, in an amount of from 0.1% to 50% by volume of the total amount of dielectric fluid said second additive acting as a good gas absorber of peroxides and hydrogen.

4,536,332

TALL'OIL FATTY ACIDS-QUALITY IMPROVEMENT

Curry B. Davis, Panama City, Fla., and Americo G. P. Frade, Cherry Hill, N.J., assignors to Arizona Chemical Company, Fair Lawn, N.J.

Filed Nov. 7, 1983, Ser. No. 549,056

Int. Cl.³ B01J *19/12;* C02F *1/32;* C09F *1/02*

U.S. Cl. 260—97.6 **3 Claims**

1. A process comprising selective photolysis of trans-3,5-dimethoxystilbene to cis-3,5-dimethoxystilbene in distilled tall oil fatty acid by irradiation of the distilled tall oil fatty acid with artificially generated actinic radiation.

4,536,333

METHOD OF POLYMERIZING ROSIN

Jerome R. Olechowski, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Aug. 22, 1984, Ser. No. 643,248

Int. Cl.³ C08H *11/00;* C08F *1/00*

U.S. Cl. 260—99.5 **14 Claims**

1. A method for the polymerization of rosin, which comprises; mixing catalytic proportions of a catalyst consisting essentially of formic acid with the rosin; and heating the mixture.

4,536,334

PREPARATION OF β-LACTAM DERIVATIVES

Makoto Sunagawa; Haruki Matsumura, both of Osaka; Takaaki Inoue, Hyogo, and Toshiyuki Hirohashi, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

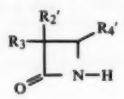
Filed Jun. 30, 1980, Ser. No. 164,396

Claims priority, application Japan, Jun. 28, 1979, 54-82411; Jul. 5, 1979, 54-85610

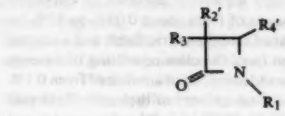
Int. Cl.³ C07D *205/08*

U.S. Cl. 260—239 A **4 Claims**

1. A process for preparing a β-lactam derivative of the formula:



wherein R_2' represents a hydrogen atom, an arylthio group, an arylsulfonyl group, an amino group, a lower alkoxycarbonylamino group, a haloalkoxycarbonylamino group or an amido group, R_3 represents a hydrogen atom or a lower alkyl group, and R_4' represents a carboxyl group; a lower alkoxycarbonyl group; an unsubstituted or substituted lower alkyl group wherein the substituent is a hydroxy group, an N-lower alkanoylamino group, a halogen atom, a cyano group, a nitro group, a lower alkoxycarbonyl group, a lower alkylcarbonyl group, an arylcarbonyl group or a gem-lower alkylenedioxy group or an unsubstituted or substituted lower alkenyl group wherein the substituent is a carboxyl group, a lower alkoxycarbonyl group, an aralkyloxycarbonyl group, a nitro group or an aryl group, which process comprises reacting a β-lactam derivative of the formula



wherein R_1 represents a mono- or diarylmethyl group and R_2', R_3 and R_4' are as defined above, with ceric ammonium nitrate having the formula $Ce(NO_3)_6(NH_4)_2$ to cleave the bond between the nitrogen atom on said β-lactam ring and the mono- or diarylmethyl group represented by R_1.

4,536,335

CARBAPENEM ANTIBIOTICS

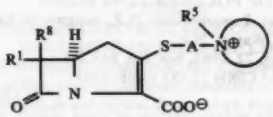
Choung U. Kim, Manlius, and Peter F. Micso, Jr., Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 389,652, Jun. 18, 1982, abandoned. This application Jun. 7, 1983, Ser. No. 499,690

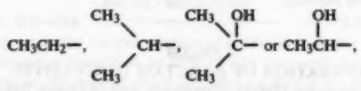
Int. Cl.³ C07D *487/04*; A61K *31/40*

U.S. Cl. 260—245.2 T **13 Claims**

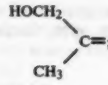
1. A compound of the formula



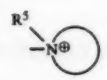
wherein R^8 is hydrogen and R^1 is hydrogen,



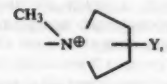
or R^1 and R^8 taken together represent



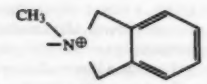
A is cyclopentylene, cyclohexylene or C_2–C_6 alkylene optionally substituted by one or more C_1–C_4 alkyl groups; and



represents



or



wherein Y is hydrogen, C_1–C_6 alkyl, hydroxy, —SC_1–C_6 alkyl, carboxyl, carbamoyl, chloro, bromo, iodo, fluoro or phenyl; or a pharmaceutically acceptable salt thereof or a benzhydryl, allyl, p-nitrobenzyl, 2-naphthylmethyl, benzyl, trichloroethyl, silyl, phenacyl, p-methoxybenzyl, acetonyl, o-nitrobenzyl, 4-pyridylmethyl, C_1–C_6 alkyl, pivaloyloxymethyl, acetoxymethyl, phthalidyl, indanyl or methoxymethyl ester.

4,536,336

NEW ANTHRACYCLINONES AND THEIR PRODUCTION

Yoshito Kishi, Belmond, Mass., assignor to Meiji Seika Kaisha, Ltd., Kyobashi, Japan

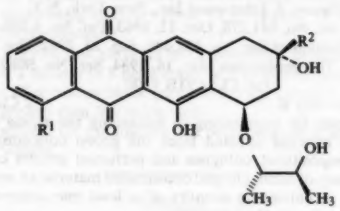
Filed Dec. 23, 1983, Ser. No. 565,216

Claims priority, application Japan, Dec. 23, 1982, 57-225089

Int. Cl.³ C07C *50/36, 49/76, 49/74*

U.S. Cl. 260—351.1 **14 Claims**

1. A compound of the formula



(I)

wherein R^1 denotes a hydrogen atom, a hydroxyl group or an alkoxyl group of 1–4 carbon atoms and R^2 denotes an ethyl group or an acetyl group.

4,536,337

PROCESS FOR THE PREPARATION OF QUINONES

Tatsuyoshi Komatsu, Kamakura; Shigeaki Numata, Yokohama; Toshihiko Sumino, Kawasaki; Katsumi Matsuzaki, Yokohama; Masao Narita, Yokohama, and Katsuhiko Hioki, Yokohama, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

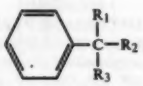
Filed Apr. 4, 1984, Ser. No. 596,695

Claims priority, application Japan, Apr. 11, 1983, 58-64315; Jan. 28, 1984, 59-14086

Int. Cl.³ C07C *50/02, 50/10, 50/16, 50/22*

U.S. Cl. 260—396 R **9 Claims**

1. A process for preparing a quinone, which comprises reacting a polynuclear aromatic hydrocarbon and a ceric salt in an aqueous acid solution in the presence of an organic solvent selected from the group consisting of chlorobenzene and an alkylbenzene represented by the general formula:



(I)

where each of R_1, R_2 and R_3 is an alkyl group and the total carbon number of the alkyl groups is from 3 to 6.

4,536,338
PROCESS FOR MANUFACTURE OF FATTY ACID ESTERS OF HYDROXY SULFONATES

Warren J. Urban, River Vale; Joseph Barillo, Glen Rock, and Jerry J. Krupa, Rockaway, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 9, 1983, Ser. No. 550,274
Int. Cl.³ C07C *143/90*; C11D *1/28*
U.S. Cl. 260—400 11 Claims

1. A method is disclosed of preparing a compound of the formula RCOOR'SO_3M, wherein R is a C_5–C_{18} alkyl group, R' is selected from the group consisting of divalent C_2–C_4 alkylene, C_6–C_8 aryl and C_7–C_8 alkylaryl radicals and M is an alkali metal cation, the process comprising:

(a) heating at 200° to 260° C. a first mixture of C_5–C_{16} monocarboxylic acid with a hydroxy sulfonate of the formula HOR'SO_3M, in a mole ratio of 1.01:1 to 2:1, in the presence of a catalyst;

(b) removing liberated water of esterification from the reaction mass and when the desired conversion to RCOOR'-SO_3M is achieved;

(c) quenching the catalyst with an effective amount to neutralize the catalyst of an alkaline compound; and

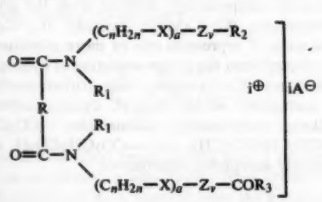
(d) adding a higher molecular weight C_{15}–C_{24} fatty acid to the reaction mixture subsequent or simultaneous with addition of alkaline catalyst quencher.

4,536,339
BISAMIDES, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Werner Ritschel, Hofheim am Taunus; Helmut Diery, Kelkheim, and Martin Hille, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

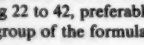
Filed Sep. 2, 1982, Ser. No. 414,509
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135832
Int. Cl.³ C11C *3/00*
U.S. Cl. 260—404.5 5 Claims

1. A bisamide of the formula



I

wherein R denotes the alkyl skeleton of a dimerized fatty acid having 22 to 42, preferably 34, C atoms, R_1 denotes hydrogen or a group of the formula



R_2 denotes hydrogen or a group —COR_3, R_3 denotes C_1–C_{22}-, preferably C_8–C_{22}-alkyl, X denotes an oxygen atom or a group of the formula N—B_m, B denotes hydrogen, methyl, ethyl, benzyl or a group of the formula —Z_v—R_2, n denotes a number from 2 to 6, a denotes a number from 0 to 5, v denotes a number from 0 to 100, but a and v are not both simultaneously zero, Z denotes a group of the formula —$C_2H_4X(C_3H_6X)_b$ or CH_2—CHY OC_nH_{2n} or C_nH_{2n}, b denotes a number from 0 to 5, preferably 0, 1 or 2, i denotes a number from to to 2(a+b)+2 and A denotes an anion, m denotes 1 or 2, and Y denotes hydrogen, methyl or ethyl.

4,536,340
PROCESS FOR THE PREPARATION OF ALKYL NONADIENOATE ESTERS

Ronnie M. Hanes, Milford, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 258,140, Apr. 27, 1981, abandoned. This application May 24, 1983, Ser. No. 497,769
Int. Cl.³ C07C *67/38*, *69/587*
U.S. Cl. 260—410.9 R 14 Claims

1. A process for reacting a mixture of 1,3-butadiene, carbon monoxide and a monoalkanol of the general formula ROH in which R is a straight or branched chain alkyl group of from 1 to about 12 carbon atoms to provide alkyl nonadienoate employing as catalyst, a palladium-ligand complex comprising:

(a) a member selected from the group consisting of zerovalent palladium, a palladium-containing composition which can provide zerovalent palladium under reaction conditions and palladium (II) salt;

(b) a strong ligand selected from the group consisting of tertiary phosphine having a pKa in water of not greater than about 6, a phosphite of the general formula $(R^1O)(R^2O)(R^3O)P$ in which each of R^1, R^2 and R^3 is an alkyl group having at least 9 carbon atoms, an aryl group or an alkaryl group, an arsine of the general formula $R^1R^2R^3As$ in which each of R^1, R^2 and R^3 have the aforestated meanings and a stibine of the general formula $R^1R^2R^3Sb$ in which each of R^1, R^2 and R^3 have the aforestated meanings, the mole ratio of said strong ligand to palladium being from about 1:1 to about 3:1, and

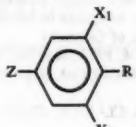
(c) a weak ligand selected from the group consisting of tertiary phosphine have a pKa in water of greater than about 6, a phosphite of the general formula $(R^4O)(R^5O)(R^6O)P$ in which each of R^4, R^5 and R^6 is an alkyl group having less than 9 carbon atoms, an arsine of the general formula $R^7R^8R^9As$ in which each of R^7, R^8 and R^9 is an alkyl group having less than 9 carbon atoms or an alkoxy group and a stibine of the general formula $R^7R^8R^9Sb$ in which each of R^7, R^8 and R^9 have the aforestated meanings, the mole ratio of said weak ligand to palladium being from about 4:1 to about 100:1.

4,536,341
SUBSTITUTED N-AROYL N'-PHENYL UREA COMPOUNDS

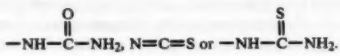
Raymond H. Rigterink, Midland, Mich., and Ronald J. Sbragia, Clayton, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 401,491, Jul. 26, 1982, Pat. No. 4,468,405. This application Aug. 3, 1983, Ser. No. 520,033
Int. Cl.³ C07C *157/09*, *122/00*, *127/19*
U.S. Cl. 260—453 AR 5 Claims

1. A compound having the formula



wherein X_1 and X_2 are halogen which may be the same or different, R is a C_1–C_4 halohaloweralkyl, haloloweralkoxy or haloloweralkylthio group and Z is NH_2, —N=C=O,

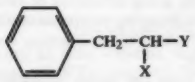


4,536,342
PROCESS FOR PRODUCING A HALOGEN-CONTAINING ETHYLBENZENE DERIVATIVE

Kiyotaka Oyama, Hikari, and Tuneo Harada, Shin-nanyo, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

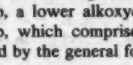
Filed Oct. 5, 1984, Ser. No. 658,047
Claims priority, application Japan, Oct. 5, 1983, 58-185023
Int. Cl.³ C07C *121/66, 69/76, 53/134*
U.S. Cl. 260—465 G **5 Claims**

1. A process for producing a halogen-containing ethylbenzene derivative represented by the general formula:



(I)

where X is a halogen atom, and Y is a nitrile group, a carboxyl group, a lower alkoxycarbonyl group or an amidocarbonyl group, which comprises reacting a vinyl compound represented by the general formula:



(II)

where Y is as defined above, with a benzenediazonium salt and halogen ions in a solvent mixture comprising a lower alcohol and/or an ether, and water, under an acidic condition with a mineral acid, in the presence of a monovalent copper compound as a catalyst.

4,536,343
PROCESS FOR PREPARING ALPHA-ARYLACRYLONITRILES

Venkataraman Ramachandran, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 29, 1984, Ser. No. 676,479
Int. Cl.³ C07C *121/75, 121/62, 121/70*
U.S. Cl. 260—465 F **17 Claims**

15. A process which comprises reacting a tetralone having a removable hydrogen alpha to the carbonyl group with an alkali metal cyanide and aluminum chloride in the presence of a catalytic amount of a tetraalkylammonium halide at a temperature of about 60°–120° C. so as to form a 1-cyano-3,4-dihydronaphthalene.

4,536,344
PROCESS FOR FORMYLATING ARYL HALIDES

Paul Fiedler, Cologne, and Rudolf Braden, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,339
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 3242582
Int. Cl.³ C07C *45/49*
U.S. Cl. 260—465 R **10 Claims**

1. In a process for formylating optionally substituted iodo-bromo- and/or chloro-aryl compound with carbon monoxide and hydrogen at a pressure from 20 to 400 bars and at a temperature in the range of 80° to 250° C. in the presence of a noble metal catalyst and a tertiary organic nitrogen compound, the improvement which comprises carrying out the formylation in the presence of a phosphane and/or phosphite, said phosphane and/or phosphite present in an amount of 10 to 1,000 times the molar amount of catalyst.

4,536,345
IMINO DERIVATIVES α-CYANO-3-PHENOXYBENZYL 2,2-DIMETHYL-3-FORMYL-CYCLOPROPANE-1-CARBOXYLATE

Jacques Martel, Bondy; Jean Tessier, Vincennes, and André Teche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 307,690, Oct. 1, 1981, Pat. No. 4,434,294, which is a division of Ser. No. 212,566, Dec. 3, 1980, Pat. No. 4,312,817. This application Sep. 26, 1983, Ser. No. 535,878
Claims priority, application France, Dec. 17, 1979, 79 30843
Int. Cl.³ C07C *121/46*
U.S. Cl. 260—465 D **2 Claims**

1. All the stereoisomeric forms of (RS)α-cyano-3-phenoxybenzyl 2,2-dimethyl-3-formyl-cyclopropane-1-carboxylate.

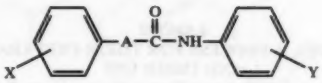
2. All the stereoisomeric forms of (S)α-cyano-3-phenoxybenzyl 2,2-dimethyl-3-formyl-cyclopropane-1-carboxylate.

4,536,346
ARALKANAMIDOPHENYL COMPOUNDS

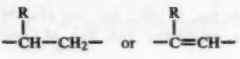
Robert G. Shepherd, Selbyville, Del., and Janis Upeslacis, Pomona, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 6, 1983, Ser. No. 492,094
Int. Cl.³ C07C *121/78, 101/44*
U.S. Cl. 260—465 D **49 Claims**

1. A compound of the formula:



wherein A is a moiety of the formulae:



wherein R is alkyl (C_1–C_4) or phenyl substituted with one or more substituents selected independently of X from the group consisting of those from which X is selected; X represents one or more substituents independently selected from the group consisting of hydrogen, (C_1–C_4)alkyl, hydroxy, (C_1–C_4)alkoxy, halo, and nitro; Y represents one or more substituents independently selected from the group consisting of hydrogen, (C_1–C_4)alkyl, hydroxy, (C_1–C_4)alkoxy, halo, trifluoromethyl, nitro, amino, acetamido, acetyl, formyl, cyano, carboxy, (C_1–C_4)carboalkoxy, carboxamido, sulfonamido, —CO_2CH-$_2CO_2C_2H_5$, —$CO_2CH_2CO_2CH_3$, and —$CO_2CH_2CO_2H$; and the pharmaceutically acceptable salts thereof.

4,536,347
SELECTIVE HYDROGENATION OF UNSATURATED CARBONYL COMPOUNDS

Michael Horner, Neustadt, and Matthias Irgang, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 397,781, Jul. 13, 1982, Pat. No. 4,465,787. This application Mar. 19, 1984, Ser. No. 590,647
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 3130805
Int. Cl.³ C07C *121/75, 29/14*
U.S. Cl. 260—465 F **4 Claims**

1. A process for hydrogenating α,β-unsaturated carbonyl compounds to obtain the corresponding α,β-unsaturated alcohols in liquid phase with hydrogen in the presence of a tertiary amine and in the presence of a ruthenium-on-charcoal or ruthenium-on-carbon black catalyst prepared by a process comprising:

a. impregnating charcoal or carbon black catalyst with a ruthenium compound;
b. modifying the ruthenium-impregnated catalyst in the dried state by mixing the powder with an iron compound; and
c. reducing the iron impregnated catalyst with hydrogen with thorough mixing.

4,536,348

DIHYDROXYALKANE DIPHOSPHONIC ACIDS

Helmut Blüm, Duesseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany

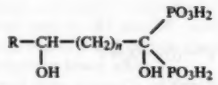
Filed Sep. 12, 1984, Ser. No. 649,868

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334211

Int. Cl.³ C07F *9/38;* **A61K** *31/66*

U.S. Cl. 260—502.4 P **4 Claims**

1. An α,ω-dihydroxyalkane-α,α-diphosphonic acid of the formula:



(I)

in which R represents hydrogen, phenyl, or a substituted phenyl wherein the substituents on the substituted phenyl are at least one of halogen, C_1–C_6 alkyl, and hydroxyl, and n is an integer of from 1 to 9, or a water-soluble salt thereof.

4,536,349

FURAN DERIVATIVES USEFUL AS AROMA COMPOUNDS

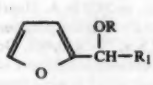
Eugene G. Harris, West Chester, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,527

Int. Cl.³ A61K *7/46;* **C11B** *9/00*

U.S. Cl. 252—522 R **2 Claims**

1. A process for providing a composition with a fragrance comprising incorporating therein an odoriferous amount of a compound having the structure:



wherein R is an alkyl group having from 1 to about 6 carbon atoms or an alkenyl group having from about 3 to about 6 carbon atoms and R_1 is selected from the group consisting of alkyl, alkenyl, cycloalkyl, cycloalkenyl and aryl.

4,536,350

PROCESS FOR MAKING CHLOROPHOSPHANES, PHOSPHINIC ACID CHLORIDES OR THIOPHOSPHINIC ACID CHLORIDE, AND NOVEL ISOMERIC MIXTURE CONSISTING OF CHLORO-PHOSPHABICYCLONONANES

Norbert Weferling, Frechen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,273

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1982, 3235787

Int. Cl.³ C07F *9/52, 9/53*

U.S. Cl. 260—543 P **7 Claims**

1. A process for making chlorophosphanes of the general formula

(I)

from primary or secondary phosphanes of the general formula

(II)

or phosphinic acid chlorides of thiophosphinic acid chlorides of the general formula

(III)

from secondary phosphane oxides or sulfides of the general formula

(IV)

in which formulae

R^1 stands for a linear or branched alkyl group, an aryl or cycloalkyl group having from 1 to 16 carbon atoms,

R^2 has one of the meanings given for R^1 or stands for hydrogen,

R^1 and R^2 are CH-bridge members of a bicyclic ring system which includes the P atom, the two said CH-bridge members, and an additional 4 to 6 carbon atoms,

R^3 has one of the meanings given for R^1,

X stands for R^1 or chlorine, and X can be R^2 when R^2 is not hydrogen, and

Y stands for sulfur or oxygen, which comprises reacting the respective starting materials with hexachloroethane at temperatures of 20° to 180° C.

4,536,351

PROCESS FOR MAKING ARYLDICHLOROPHOSPHANES

Hubert Neumaier, Brühl, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

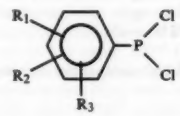
Filed Dec. 15, 1983, Ser. No. 561,807

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248483

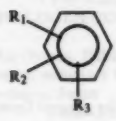
Int. Cl.³ C07F *9/52*

U.S. Cl. 260—543 P **5 Claims**

1. In a process for making aryl-dichlorophosphanes of the formula



in which R_1, R_2 and R_3 being identical or different each stand for a hydrogen atom, an alkyl group having from 1 to 8 carbon atoms, a halogen atom, an aryl group or an aryloxy group by reacting an arene of the formula



in which R_1, R_2 and R_3 have the meanings given above, with excess phosphorus(III)chloride in the presence of aluminum chloride by boiling the mixture over a period of several hours and subsequently precipitating the aluminum chloride by adding a complexing agent, filtering and distillatively working up the filtrate, the improvement which comprises: using 0.05 to 0.9 mol aluminum chloride per mol arene and 1–3 mols finely ground alkali metal chloride as the complexing agent per mol aluminum chloride.

4,536,352

PERFLUORO VINYL ETHERS

Kyoji Kimoto, Kanagawa; Hirotsugu Miyauchi, Tokyo; Jukichi Ohmura, Kanagawa; Mikio Ebisawa, Kanagawa, and Toshioki Hane, Kanagawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 152,856, May 23, 1980, U.S. Pat. No. 4,329,435.

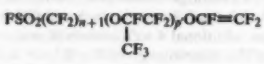
This application Dec. 14, 1981, Ser. No. 330,608

Claims priority, application Japan, May 31, 1979, 54-67889; Jul. 18, 1979, 54-90302; Dec. 21, 1979, 54-165675; Dec. 26, 1979, 54-168179; Dec. 28, 1979, 54-170315

Int. Cl.³ C07C *143/70*

U.S. Cl. 260—543 F **2 Claims**

1. A fluorinated vinyl ether compound represented by the formula:



wherein n is 2 and p′ is an integer of 0 to 1.

4,536,353

PROCESS FOR PREPARING α-KETONITRILES

Eckart Kranz, Wuppertal, and Kurt Findeisen, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

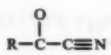
Filed Nov. 2, 1984, Ser. No. 667,524

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340933

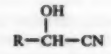
Int. Cl.³ C07C *120/00*

U.S. Cl. 260—545 R **8 Claims**

1. A process for preparing an α-ketonitrile of the formula



in which R is optionally substituted aryl, comprising reacting a cyanohydrin of the formula



with sulphuryl chloride or thionyl chloride.

4,536,354

PROCESS FOR THE PREPARATION OF CARBOXYLIC ANHYDRIDES

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

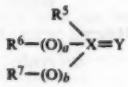
Filed Dec. 12, 1983, Ser. No. 560,094

Claims priority, application Netherlands, Dec. 17, 1982, 8204883

Int. Cl.³ C07C *51/12*

U.S. Cl. 260—549 **19 Claims**

1. Process for the preparation of a carboxylic anhydride by reacting under virtually water-free conditions an ester having the formula $R^1COOCH_2R^2$ or an ether having the formula R^3OR^4 in which R^1, R^3 and R^4 represent hydrocarbon groups containing up to 20 carbon atoms and which may be substituted with halogen atoms, and R^2 represents hydrogen or a hydrocarbon group containing up to 20 carbon atoms and which may be substituted with halogen atoms; with carbonmonoxide in the presence of a nickel catalyst, an iodide and/or bromide source and at least one co-promoter, the improvement comprising that the reaction is carried out in the presence of: (A) a compound having the formula



I

in which X represents phosphorus, arsenic or antimony and Y oxygen, sulphur or selenium and a and b are 0 or 1 and R^5 represents hydrogen or a hydrocarbon group containing up to 30 carbon atoms which may be substituted with halogen atoms and R^6 and R^7 represent a hydrocarbon group containing up to 30 carbon atoms which may bear substituent selected from the group consisting of halogen atoms, and a $R^9R^{10}X{=}Y$ group wherein X and Y are defined above and R^9 and R^{10} represent a hydrocarbon group containing up to 8 carbon atoms, or a and b are 0 and R^6 and R^7 together form a heterocyclic group with X, and R^5 is as defined above; or (B) in the presence of a complex of a compound having the formula I with a hydrocarbon iodide or bromide, an acyl iodide or bromde or HI or HBr.

4,536,355

PHENOXYPHENYLAMINOALKYLPHOSPHINATES USEFUL IN WEED CONTROL

Shy-Fuh Lee, Sunnyvale, and Clive A. Henrick, Palo Alto, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

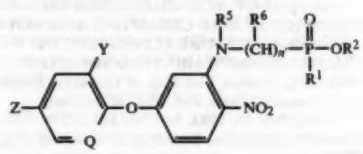
Continuation-in-part of Ser. No. 433,486, Oct. 8, 1982, Pat. No. 4,456,464, which is a continuation-in-part of Ser. No. 379,587, May 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 317,622, Nov. 2, 1981, abandoned, and a continuation-in-part of Ser. No. 317,623, Nov. 2, 1981, abandoned. This application Apr. 11, 1984, Ser. No. 599,044

The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.³ C07F *9/30, 9/32*; A01N *57/14, 57/22*

U.S. Cl. 260—944 **5 Claims**

1. A compound of the following formula:



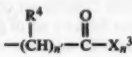
wherein,

n′ is 1, 2 or 3; n is zero or 1;

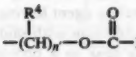
R^1 is lower alkyl,

R^6 is hydrogen or lower alkyl;

R^5 is hydrogen or lower alkyl;
Q is CH;
Y is hydrogen or chloro;
Z is chloro or trifluoromethyl; and
R^2 is selected from group (1), (2) or (3);



(1)



(3)

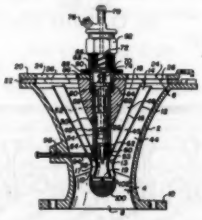
(3) hydrogen, metal cation, lower alkyl, lower haloalkyl, lower cyanoalkyl, cycloalkyl, cycloalkalkyl, heterocycloalkyl, heterocycloalkalkyl, lower alkenyl, lower haloalkenyl, lower alkynyl, lower haloalkynyl, lower alkoxyalkyl, lower alkylthioalkyl, lower dialkylaminoalkyl, or substituted or unsubstituted aryl;
R^3 is lower alkyl, lower haloalkyl, lower alkenyl, lower haloalkenyl, cycloalkyl, cycloalkalkyl, substituted or unsubstituted aryl or R^3 and R^4 taken together form an alkylene group of 2 to 4 carbon atoms;
R^4 is hydrogen or lower alkyl;
R^7 is selected from group (3) or R^2; and
X^3 is oxygen, sulfur or methylene.

4,536,356

CARBURETOR

Ching C. Li, 11231 Kingsbridge Dr., Richmond, British Columbia, Canada V7A 4T1

Filed Dec. 13, 1983, Ser. No. 560,980
Int. Cl.³ F02M 7/20
U.S. Cl. 261—50 R 10 Claims



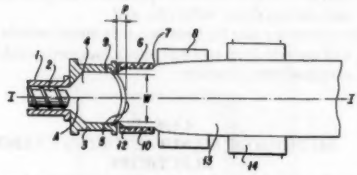
1. A carburetor for an internal combustion engine, the carburetor comprising:
an outer body defining a first venturi and having an inlet and an outlet;
a first inner body located in the outer body and defining a second venturi and having an inlet and an outlet;
a second inner body located within the first inner body;
a throttle valve to control air supply to the inlets of the inner and outer bodies;
means within the outer and first and second inner bodies to agitate air flowing through the bodies;
an injector nozzle positioned to feed fuel to the second venturi;
a valve to control fuel supply through the injector nozzle;
sensor means to effect movement of said valve; and
an idle jet to feed air to said second venturi downstream of the injector nozzle.

4,536,357

METHOD AND APPARATUS FOR PREPARING MULTI-CELLULAR FOAMED BOARD OF THERMOPLASTIC RESIN

Motoshige Hayashi; Toshirou Kobayashi; Motokazu Yoshii, all of Nara; Masahiro Tsubone, Koga, and Mikio Ishikawa, Oyama, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Jan. 30, 1984, Ser. No. 575,127
Claims priority, application Japan, Jan. 28, 1983, 58-13406
Int. Cl.³ B29D 27/00
U.S. Cl. 264—53 14 Claims



1. A method for preparing a multi-cellular foamed board of thermoplastic resin which comprises forming under pressure in a die a thermoplastic resin melt containing a foaming agent to give the resin melt a shape of a flat board having a broad width compared with a thickness thereof, extruding the resin melt from the die having the convex forward end with a middle portion in the width direction thereof protruding the greatest toward the extruding direction, introducing thus extruded resin melt immediately into a moulding passage having a concave end engaging with the said convex forward end of the die, allowing the resin melt to expand in the thickness direction at the portion adjacent to and extending along the concave end of the passage, and thereafter allowing the resin melt to expand in both the thicknes and width directions of the board in the passage.

4,536,358

PROCESS FOR THE PRODUCTION OF HIGH SURFACE AREA CATALYST SUPPORTS

Lawrence B. Welsh, Evanston, and Richard W. Leyerle, Arlington Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 274,333, Jun. 17, 1982, abandoned. This application Jul. 1, 1983, Ser. No. 510,478
Int. Cl.³ B29J 1/00
U.S. Cl. 264—81 17 Claims

1. A process for the production of a high surface area microporous metal carbide or metalloid carbide which possesses a physical configuration replicating that of a carbon-donor substrate consisting essentially of a carbonaceous pyropolymer possessing recurring units containing at least carbon and hydrogen atoms and which itself replicates a highly porous refractory microporous inorganic oxide which comprises the steps of:
(a) polymerizing an organic pyrolyzable substance containing at least carbon and hydrogen on the surface of said highly porous high surface area inorganic oxide having an internal surface area in the range of from about 1 to about 2000 m^2/g in a reducing atmosphere at a temperature in the range of from about 400° to about 1200° C. to form said carbon-donor substrate consisting essentially of a carbonaceous pyropolymer possessing recurring units containing at least carbon and hydrogen atoms, said carbon-donor substrate replicating said highly porous surface of said refractory inorganic oxide;
(b) uniformly depositing a carbide-forming metal or metalloid on the internal pore surfaces of said carbon-donor substrate which replicates said highly porous refractory inorganic oxide in the vapor phase at a temperature in the range of from about 300° to about 450° C. to afford a

maximum uniform deposition of said metal or metalloid on the surfaces within the internal pore structure of said carbon-donor substrate;

(c) heating said carbide-forming metal or metalloid on said carbon-donor substrate at a temperature in the range of from about 1000° to about 1800° C. to permit formation of said high surface area microporous metal carbide or metalloid carbide by reaction of said carbide-forming metal or metalloid with said carbon in said carbon-donor substrate wherein the resultant high surface area microporous metal carbide or metalloid carbide possesses a pore structure and physical configuration replicating the shape and dimension as well as a substantial portion of the pore structure of said carbon-donor substrate, and

(d) recovering said high surface area metal carbide or metalloid carbide from said refractory inorganic oxide and said carbon-donor substrate.

4,536,359

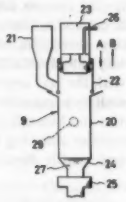
METHOD OF MANUFACTURING CARBON ELECTRODE

Torata Tanaka, Itami, Japan, assignor to Nikku Industry Co., Ltd., Hyogo, Japan

Filed Oct. 11, 1983, Ser. No. 540,976

Int. Cl.³ B29B 1/04

U.S. Cl. 264—102 **1 Claim**



1. A method of manufacturing carbon electrodes, which comprises the steps of: kneading 100 parts of regular coke with 25 to 50 parts of a binder selected from the group consisting of coal tar pitch, coal tar and a synthetic resin at a temperature of 140° to 170° C.,

dividing the resultant kneaded mixture into a plurality of portions,

compressing sequentially portion by portion the divided portions of the kneaded mixture at a pressure of 1500 to 3000 tons while being subjected to a vacuum below 300 Torr in a manner such that when a first divided portion is compressed, a second portion is supplied on top of the first compressed portion and compressed at the same pressure under the same vacuum,

extrusion-molding the compressed mixture as a whole, after the whole of the divided portions of the mixture is thus compressed,

baking the resultant extrudate,

filling the baked product with an impregnator, and

subjecting the resultant product to a secondary baking.

4,536,360

GLASS FIBER REINFORCED VINYL CHLORIDE POLYMER PRODUCTS AND PROCESS FOR THEIR PREPARATION

Douglas B. Rahrig, Brunswick, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 13, 1984, Ser. No. 630,421

Int. Cl.³ C08K 9/00, 9/06

U.S. Cl. 264—142 **18 Claims**

1. A thermoplastic composition of vinyl chloride resin and glass fibers particularly well-adapted to be thermoformed, comprising a mixture of,

(a) from about 50 percent to about 95 percent by weight (% by wt) based on the combined weight of glass fibers and vinyl chloride resin, of a vinyl chloride resin in which the vinyl chloride portion of each repeating unit contains from about 57% to about 72% by wt of chlorine,

(b) from about 5% to about 50% by wt of glass fibers having a diameter less than about 20 microns, wherein said glass fibers are coated with a size consisting essentially of

(i) an amino silane coupling agent having a reactive amine moiety which upon reaction with said resin results in a compound having a peak in a proton magnetic resonance spectra at 5.65 ppm, and

(ii) a film former consisting essentially of a polymer having a ring-opened lower alkylene oxide containing from about 1 to about 4 carbon atoms as an essential component in a repeating unit optionally containing another copolymerizable component, and,

(c) a stabilizer for said homopolymer in an amount sufficient to provide desired stability of the composition during thermoforming.

4,536,361

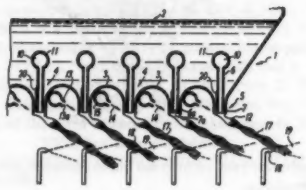
METHOD FOR PRODUCING PLASTIC MICROFILAMENTS

Leonard B. Torobin, Materials Technology Corp., Tower Pl., Suite 1425, 3340 Peach Tree Rd., NE., Atlanta, Ga. 30326

Continuation-in-part of Ser. No. 428,923, Sep. 30, 1982, and Ser. No. 325,594, Nov. 27, 1981, Pat. No. 4,363,646, which is a continuation-in-part of Ser. No. 152,693, May 23, 1980, Pat. No. 4,303,431, which is a continuation of Ser. No. 59,297, Jul. 20, 1979, abandoned, said Ser. No. 428,923, is a continuation of Ser. No. 103,113, Dec. 13, 1979, abandoned, which is a division of Ser. No. 59,296, Jul. 20, 1979, abandoned, said Ser. No. 59,297, and Ser. No. 59,296, each is a continuation-in-part of Ser. No. 937,123, Aug. 28, 1978, abandoned, and Ser. No. 944,643, Sep. 21, 1978, abandoned. This application Nov. 16, 1982, Ser. No. 442,108

Int. Cl.³ D01D 5/04

U.S. Cl. 264—167 **18 Claims**

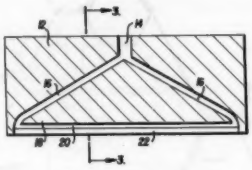


1. A method for making microfilaments from an organic film forming material which comprises forming a liquid film of said organic material across an orifice, applying a blowing gas at a positive pressure on the inner surface of the liquid organic film to blow the film and form an elongated hollow organic material tube or cylinder, forming a thinned wall or weakened portion of the elongated hollow tube or cylinder, subjecting the elongated hollow tube or cylinder during its formation to an external pulsating or fluctuating pressure field having periodic osciallations, said pulsating or fluctuating pressure field acting on said elongated hollow tube or cylinder to assist in its formation and to assist in the formation of a multiplicity of organic material microfilaments and in detaching the organic material microfilaments from said orifice.

4,536,362
METHOD FOR PRODUCING LONGITUDINALLY RIBBED PLASTIC FILM

Jack J. Donaldson, Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,600
Int. Cl.³ B29F 3/04
U.S. Cl. 264—171 8 Claims



1. A process for extruding a plastic film, comprising: transporting molten resin to an extrusion die inlet;

flowing said resin under pressure from said inlet to a narrow outlet, comprising two spaced, substantially planar lips, said resin flowing in a given direction across said lips, one of said lips being interrupted by a plurality of substantially parallel slots, said slots running at an angle to the given direction, and being spaced so that resin flowing in said given direction across said slotted die lip passes across at least one of said slots;

drawing said extruded film from said outlet in a direction substantially the same as said given direction to produce an extruded film having ribs formed by said slots extending in the given direction.

4,536,363
PROCESS FOR PRODUCTION OF SET POLYACRYLONITRILE FILAMENTS AND FIBERS

Walter Fester, Königstein, and Bernd Huber, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 359,233, Mar. 18, 1982, Pat. No. 4,446,206.
This application Dec. 7, 1983, Ser. No. 558,956
Claims priority, application Switzerland, Mar. 20, 1981, 1918/81
Int. Cl.³ D01F 6/18
U.S. Cl. 264—182 1 Claim

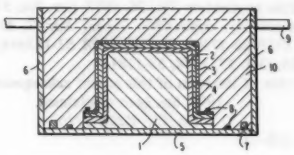
1. In a process for the production of filaments and fibers of acrylonitrile polymers, having a filament-forming substance which is composed of at least 98% by weight of acrylonitrile units, by a wet or dry spinning method, a multi-stage stretch and a setting of the resulting filaments, the improvement comprising wet-stretching a fiber-forming polymer having a relative viscosity between 2.5 and 6.0, said filaments being drawn from a jet before or after a wash, drying said filaments under tension on hot rolls, after-stretching said filaments at 140° to 200° C. under the action of dry heat, an after-stretch ratio being at least 1:1.5 with the total stretch ratio being at least 1:9; and subsequent to after-stretching, setting the filaments with shrink prevention at 170° to 280° C. by the action of dry heat.

4,536,364
MANUFACTURE OF TWO PART MOLD

Kjell J. Lindskog, Floravägen 27, S-931 00 Skellefteå, Sweden

PCT No. PCT/SE83/00171, § 371 Date Dec. 21, 1983, § 102(e) Date Dec. 21, 1983, PCT Pub. No. WO83/03792, PCT Pub. Date Nov. 10, 1983
PCT Filed Apr. 29, 1983, Ser. No. 574,098
Claims priority, application Sweden, Apr. 30, 1982, 8202745
Int. Cl.³ B29C 1/02; B28B 7/34
U.S. Cl. 264—227 4 Claims

1. A method of manufacturing a set of moulds comprising a male mould and a female mould arranged to be brought together to form therebetween a mould cavity, in which objects can be moulded from a plastics material, wherein a model of the object to be moulded is first produced, said model having one at least partly convex surface whose shape corresponds to the shape of the outer surface of the object to be moulded, using said model for the manufacture of said female mould by forming at least one relatively thin layer of plastics material over the model, which plastics layer will serve as a removable mould shell in the female mould, whereafter a material in a shapeable condition which upon hardening can form a support part for said mould shell of said female mould is supplied to a mould encircling said mould shell, and using the female mould for the manufacture of the male mould, whereat a material

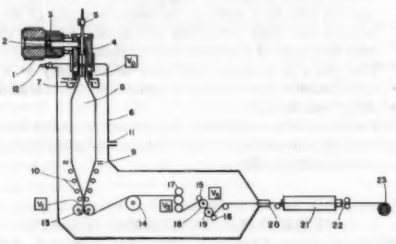


layer having a thickness corresponding to the thickness of the object to be moulded is first applied in the female mould to thereby define the dimensions of the mould cavity, said manufacture of the male mould being carried out by coating the layer in the female mould corresponding to the object to be moulded with at least one relatively thin layer of plastics material which plastics layer will serve as a removable mould shell on the male mould, whereafter a material in a shapeable condition which upon hardening can form a support part for said mould shell is supplied to a mould encircling said mould shell, and thereafter separating said female mould from said male mould, removing said material layer having a thickness corresponding to the thickness of the object to be moulded.

4,536,365
PROCESS FOR THE MANUFACTURE OF EQUALLY BIAXIALLY ORIENTED FILM

Maurice M. Zwick, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 22, 1983, Ser. No. 564,456
Int. Cl.³ D01F 11/00
U.S. Cl. 264—558 3 Claims



1. A process for preparing an equally biaxially oriented barrier film which comprises preparing a liquified film-forming polymer, extruding said liquified film-forming polymer through an annular die directly into a pressurized solidification zone to form a tubular film, orienting said tubular film essentially in the radial direction only by introducing vapor under pressure into the interior of said tube while minimizing orientation in the longitudinal direction, orienting said radially oriented tubular film in the longitudinal direction, said radial and

longitudinal orientations being conducted within said pressurized solidification zone, said longitudinal orientation being less than said radial orientation and equal to the radial orientation remaining after the biaxially oriented tubular film undergoes radial shrinkage upon drying thereof in the absence of radial shrinkage control, drying said biaxially oriented film in the absence of radial shrinkage control and recovering the resultant equally biaxially oriented film.

4,536,366

SINTERING METHOD AND APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Continuation of Ser. No. 225,988, Jan. 19, 1981, abandoned, which is a division of Ser. No. 27,662, Apr. 6, 1979, Pat. No. 4,273,581.

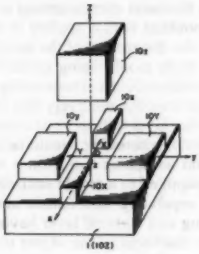
This application Jul. 26, 1983, Ser. No. 517,469

Claims priority, application Japan, Apr. 7, 1978, 53-40193; Apr. 24, 1978, 53-47902; Sep. 18, 1978, 53-113644; Oct. 4, 1978, 53-121466; Oct. 17, 1978, 53-128144

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ B22F *3/16*

U.S. Cl. 419—11 **7 Claims**



1. A method of densifying a coherent mass of material having a density in the range between 60 and 90% of a maximum density of said material, said method comprising the steps of:

(a) loading said mass into a substantially closed three-dimensional space defined by a first, a second and a third pair of punches juxtaposed thereacross in a first, a second and a third direction, respectively;

(b) energizing said mass with the thermal energy while multi-axially compressing said mass by advancing relatively to one another of said punches of each of said first, second and third pairs in the respective one of said first, second and third directions across said mass so that the axes of action of pressures extend thereon by said respective pairs of punches intersect substantially at a point substantially constituting a center of said three-dimensional space; and

(c) successively modifying the pressures exerted on said mass by at least two of said first, second and third pairs of punches cyclically.

4,536,367

METHOD FOR SANITIZING TOILETS

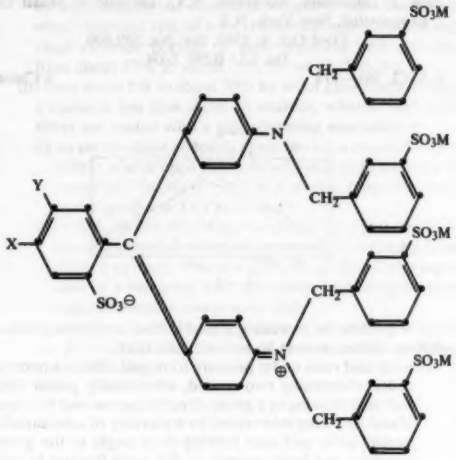
William M. Hung, Cincinnati, Ohio, and Patrick J. Jefferies, Fort Mitchell, Ky., assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Filed Dec. 9, 1983, Ser. No. 559,999

Int. Cl.³ E03D *9/02*; A61L *2/16*

U.S. Cl. 422—37 **17 Claims**

1. A method of treating a flush toilet which comprises a flush tank and bowl, with a sanitizing agent each time the toilet is flushed, and providing a persistent color to the bowl water between flushes, said method comprising the step of dispensing into the flush water an aqueous solution which contains; (A) a sanitizing agent having oxidizing characteristics and (B) a triphenylmethane dyestuff selected from the group having the formula



in which

X represents hydrogen or the group SO_3M;

Y represents hydrogen or hydroxy; and

M represents an alkali metal cation, an ammonium cation or an alkaline earth metal cation.

4,536,368

METHOD FOR SANITIZING TOILETS

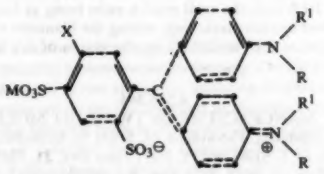
William M. Hung, and Jack M. Knox, both of Cincinnati, Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Filed Dec. 9, 1983, Ser. No. 560,000

Int. Cl.³ E03D *9/02*; A61L *2/16*

U.S. Cl. 422—37 **11 Claims**

1. A method of treating a flush toilet which comprises a flush tank and bowl, with a sanitizing agent each time the toilet is flushed, and providing a persistent color to the bowl water between flushes, said method comprising the step of dispensing into the flush water an aqueous solution which contains (A) a sanitizing agent having oxidizing characteristics, and (B) a triphenylmethane dyestuff selected from the group having the formula



in which:

R represents benzyl substituted in the benzene ring by SO_3M in which M represents an alkali metal cation, an ammonium ion or an alkaline earth metal cation;

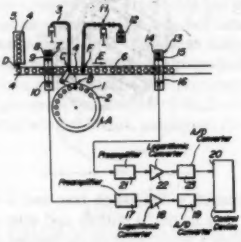
R^1 represents a non-tertiary C_1 to C_4 alkyl; and

X represents hydrogen or hydroxy.

4,536,369
AUTOMATIC ANALYZING APPARATUS

Masahiko Sakurada, Machida; Sugio Manabe, Kodaira; Hideaki Okamura, Kawasaki, and Nagahiro Gocho, Hachioji, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 246,055
Claims priority, application Japan, Mar. 21, 1980, 55-36480
Int. Cl.³ G01N *35/02*
U.S. Cl. 422—65 4 Claims



1. An automatic analyzing apparatus comprising means for transferring a reaction vessel along a given traveling path in a stepwise manner pitch by pitch;

means arranged on the traveling path at a reagent distribution position for distributing a reagent corresponding to a measurement item to be tested into the reaction vessel transferred into the reagent distribution position;

means arranged on the traveling path at a sample distribution position which is downstream with respect to said reagent distribution position, said sample being distributed into the reaction vessel to form a reaction liquid;

a first photometric unit arranged on the traveling path at a position between the reagent distribution position and the sample distribution position for measuring an absorption degree of the reaction vessel and the reagent contained in the reaction vessel;

a second photometric unit arranged on the traveling path at a downstream position with respect to said sample distribution position for measuring an absorption degree of the reaction liquid through the reaction vessel;

means for correcting the absorption degree of the reaction liquid on the basis of the absorption degree of the reaction vessel and the reagent to derive a corrected absorption degree of the reaction liquid alone;

means arranged on the traveling path at an upstream position with respect to said reagent distribution position for supplying new reaction vessels onto the reaction vessel transferring means; and

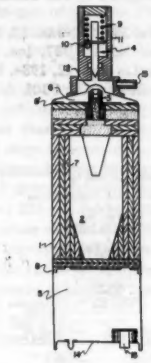
means arranged on the traveling path at a downstream position with respect to the second photometric unit for removing the reaction vessels containing the reaction liquids from the traveling path.

4,536,370
CHEMICAL OXYGEN GENERATOR

Rainer Hahn, Lubeck, Fed. Rep. of Germany, assignor to Dräger werk Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,762
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210959
Int. Cl.³ B01J *7/00*; A62B *7/08*
U.S. Cl. 422—120 7 Claims

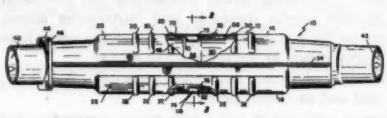
1. A chemical oxygen generator comprising a pressure vessel having an outlet, manually releasable starting means associated with said pressure vessel, an oxygen candle supported in said pressure vessel in a position leaving a lower empty space therebelow and an upper empty space thereabove as well as a free space around said oxygen candle, the empty spaces and said free spaces being in common open flow communication with each other and with said oxygen candle and being filled in a ready state with compressed oxygen which can flow out through said outlet, a severable membrane closing the spaces to said outlet, and starting means for starting the operation of said candle being movable to sever said membrane to permit flow out of said outlet.



4,536,371
CATALYTIC CONVERTER DIVIDER

Timothy Z. Thayer, Hope, and Frank W. Shaw, Columbus, both of Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed May 16, 1983, Ser. No. 494,618
Int. Cl.³ B01D *50/00*
U.S. Cl. 422—171 10 Claims



1. A clam shell type catalytic converter comprising

a first shell half and a second shell half which are joined with a longitudinal perimetrical seam to form a body which defines a longitudinally extending body interior in which a first substrate and a second substate are disposed, an inlet disposed adjacent the first substrate, and an outlet disposed adjacent the second substrate, each shell half including an interior wall which defines an intermediate portion of the body having a generally constant transverse cross section,

a ring-shaped divider comprising first and second C-shaped divider halves, each divider half including a pair of divider flanges extending comformably adjacent to the intermediate portion of the interior wall of one shell half, the divider flanges being disposed substantially parallel to the intermediate portion of the interior wall of one of the shell halves and including a portion between the flanges which is recessed inwardly from the interior wall of the one shell half,

wherein the divider flanges are selectively attached to the linear interior walls at one of a plurality of locations along the intermediate portion of the interior walls to position the divider for accommodating substrates of various sizes.

4,536,372

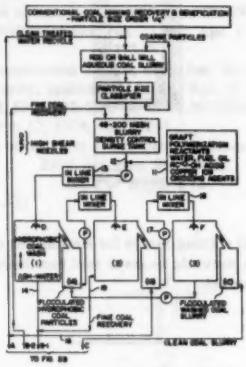
APPARATUS FOR BENEFICIATING COAL

Lester E. Burgess, Springfield; Karl M. Fox, Swarthmore; Philip E. McGarry, Palmerton, and David E. Herman, Jim Thorpe, all of Pa., assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 339,351, Jan. 15, 1982, abandoned, which is a division of Ser. No. 114,357, Jan. 22, 1980, Pat. No. 4,332,593. This application Apr. 12, 1984, Ser. No. 599,204

Int. Cl.[3] B01J 8/00; C10L 1/32

U.S. Cl. 422—187 4 Claims



1. Apparatus for beneficiating coal comprising:

means providing coal reduced to small particles of coal and small particles of ash in an aqueous carrier;

means introducing graft polymerization reactants and oil into said carrier upon discharge from said coal reducing means;

means providing and containing a supply of graft polymerization reactants, means connecting the polymerization reactant supply means to said introducing means, and means for conveying the polymerization agent from said supply means to the introducing means;

a plurality of serially connected wash cells, each having an inlet and an outlet thereto;

aqueous coal carrier conveying means conveying said carrier to a first of said serially connected wash cells;

conduit means for said carrier, connecting and communicating said coal reducing means to said inlet of said first wash cell, and each of subsequent serial wash cell inlets to the previous wash cell outlet, and having separate in line mixing means located in each conduit means, said mixing means mixing said carrier;

said wash cells each having a tank containing a body of wash water having an upper surface, a body of gas above said wash water upper surface, a nozzle at said inlet of each said wash cell atomizing said carrier into fine droplets and propelling said fine droplets through said body of gas against said wash water upper surface, means at said upper surface of said wash water removing said small particles of coal from said wash water and said tank;

means introducing water into said removed small particles of coal after removal from each said cell, except said last serially connected wash cell, and means conveying said small particles of coal and water through said conduits to said next serially connected cell; and,

means conveying said coal particles from said last serially connected wash cell to mechanical drying means adapted to extract water from said coal particles collected at said last serially connected wash cell.

4,536,373

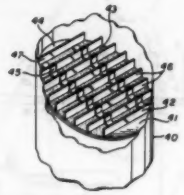
CONTACT STRUCTURE FOR USE IN CATALYTIC DISTILLATION

Edward M. Jones, Jr., Friendswood, Tex., assignor to Chemical Research & Licensing Company, South Houston, Tex.

Division of Ser. No. 390,395, Jun. 21, 1982,. This application Oct. 19, 1983, Ser. No. 543,440

Int. Cl.[3] B01J 35/04

U.S. Cl. 422—211 5 Claims



1. In combination a distillation tray and a contact catalyst structure said tray having a bottom and sides defining a weir means for holding a liquid level on the bottom of said tray, said tray catalyst structure comprising a plurality of porous closed containers, containing therein solid particulate catalyst, and a plurality of clip means mounted on said bottom of said tray for holding and spacing said containers as a unit, each said clip means comprising at least one structure comprising a base member mounted on said bottom and a plurality of resilient pairs of members upwardly extending from said base member substantially perpendicular thereto for grasping and holding a said container above the bottom of said tray.

4,536,374

PROCESS USING CARBONATE REAGENT FOR RECOVERING VANADIUM FROM COKES AND ASHES DERIVED FROM HEAVY OILS

Lois L. McCorriston, Mississauga, Canada, assignor to Gulf Canada Limited, Toronto, Canada

Division of Ser. No. 516,629, Jul. 25, 1983, Pat. No. 4,472,360, which is a continuation-in-part of Ser. No. 334,103, Dec. 24, 1981, abandoned, which is a continuation of Ser. No. 198,501, Oct. 20, 1980, abandoned. This application May 8, 1984, Ser. No. 608,313

Int. Cl.[3] C01G 31/00

U.S. Cl. 423—68 9 Claims

1. A process for the recovery of vanadium from a sulphur-containing material of the group consisting of coke derived from hydrocarbonaceous oil and ash obtained from said coke, wherein said hydrocarbonaceous oil is heavy oil, in-situ oil sands bitumen or mineable oil sands bitumen, comprising:

(a) mixing said material with an alkali metal carbonate reagent in a finely divided form,

(b) heating the mixture in the presence of an oxidizing atmosphere at an elevated temperature below the fusion point of the reagent,

(c) contacting the resulting solid residue and water to form a leach solution, and

(d) recovering the vanadium values from the leach solution, wherein said material comprises vitrified materials and the amount of said alkali metal carbonate is at least twice the combined stoichiometric amount sufficient both to convert the vanadium values present in said material into alkali metal vanadate and to react with the sulphur present in said material, and insufficient to cause the substantial carryover of said alkali metal carbonate into said leach solution.

4,536,375

PURIFICATION OF GASES

Andrew Holt, Enfield, and David W. White, Radlett, both of England, assignors to M.P. United Drug Company Limited, England

Filed Oct. 18, 1983, Ser. No. 543,075
Claims priority, application United Kingdom, Oct. 18, 1982, 8229655; Mar. 7, 1983, 8306168
Int. Cl.³ B01D *53/36*
U.S. Cl. 423—247 9 Claims

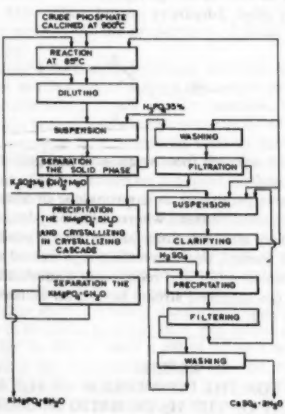
1. A method of reducing the carbon monoxide content of a carbon monoxide-contaminated breathable gas by bringing the contaminated gas into contact with a bed of catalyst, whereby to oxidise carbon monoxide in the gas to carbon dioxide, in which method the catalyst comprises a promoted tin IV oxide-supported precious metal catalyst, the promoter being one or more metals of group 1b, 3b, 7b and 8 of the Periodic Table and the precious metal being platinum, palladium, rhodium, iridium or ruthenium.

4,536,376

METHOD OF PRODUCING POTASSIUM MAGNESIUM PHOSPHATE

Karl-Richard Löblich, Barsinghausen, Fed. Rep. of Germany, assignor to Kali und Salz AG, Kassel, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 492,162
Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3216973
Int. Cl.³ C01B *25/26*
U.S. Cl. 423—306 13 Claims



1. Process for the production of potassium magnesium phosphate by reacting basic magnesium compound with phosphoric acid or phosphate in the presence of a potassium sulfate excess wherefrom the formed potassium magnesium phosphate is separated from the mother liquor, washed with water and dried, comprising stirring into said mother liquor containing magnesium sulfate and potassium sulfate a free calcium oxidic containing material in amounts corresponding to an equimolar ratio of free calcium oxidic and dissolved magnesium sulfate, thereby producing a turbidity, providing an acid pH in said turbidity, separating the solid phase, stirring in potassium sulfate for formation of potassium magnesium phosphate and for maintenance of in said mother liquor the potassium sulfate content, adjusting the pH- of said reaction mixture basic and separating any crystallizate falling out as product from said mother liquor from said reaction mixture, the said mother liquor is then recycled to the process start.

4,536,377

PROCESS FOR MAKING SODIUM TRIPOLYPHOSPHATE

Lawrence A. Shimp, Robbinsville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 376,909, May 10, 1982, abandoned. This application Aug. 8, 1984, Ser. No. 639,280
Int. Cl.³ C01B *25/30*
U.S. Cl. 423—315 4 Claims

1. A one step spray drying process for making high assay, 90% or greater, sodium tripolyphosphate having a high concentration, greater than 75%, of form I material consisting essentially of the steps of spraying an aqueous sodium orthophosphate feed liquor having an $Na_2O:P_2O_5$ ratio of 1.60 to 1.70 into a spray dryer, dehydrating the sprayed feed to a temperature above 250 and below 420° C. in a period of up to one minute to produce sodium tripolyphosphate, removing the product sodium tripolyphosphate, which has a temperature below 420° C., from the dryer and cooling the product to 150° C. or below in twenty minutes or less.

4,536,378

PHOSPHATE FERTILIZER PRODUCTION

Edward A. White, 2250 Greenfield Dr., Glenview, Ill. 60025

Filed Oct. 13, 1983, Ser. No. 541,512
Int. Cl.³ C01B *25/16, 15/16;* B21B *45/02*
U.S. Cl. 423—321 R 14 Claims

1. A process for the preparation of phosphoric acid comprising:

providing a source stream of phosphoric acid comprising more than about 30% P_2O_5, said source stream having impurities;

removing from the source stream from about 1% to about 20% of said stream to form a treatment stream;

removing at least about 90% of the cationic, anionic and organic impurities in the treatment stream by solvent extraction; and

combining at least a portion of the treatment stream with the balance of the source stream in proportions sufficient to form an improved phosphoric acid stream having reduced post-precipitation when said improved stream is processed to produce merchant phosphoric acid.

4,536,379

PRODUCTION OF SILICON CARBIDE

Walter H. Carlson, Aurora; Gerald B. Zander, North Olmsted; George C. Hanna, Chagrin Falls, and Kevin L. Burmeister, Kent, all of Ohio, assignors to Graphite Sales, Inc., Chagrin Falls, Ohio

Filed Jun. 2, 1983, Ser. No. 500,522
Int. Cl.³ C01B *31/36*
U.S. Cl. 423—345 19 Claims

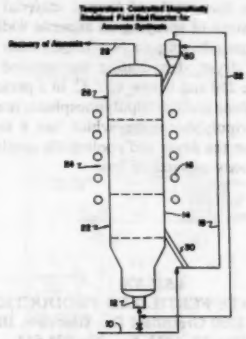
1. A process for the production of silicon carbide crystals and whiskers comprising reacting at a temperature of between about 1,400° C. to about 2,100° C. and in the presence of an inert gas, a mined material of nature referred to herein as Black Diamond having as essential ingredients, carbon, silica, aluminum, iron oxide, potassium oxide, volatiles and moisture wherein a typical composition based on weight, comprises about 3% moisture, about 33% carbon, about 8% volatiles, and about 56% ash, said ash including, based on the weight of the ash, about 76.8% silica, about 12.9% alumina, about 4.6% iron oxide, and about 2.4 potassium oxide, and said typical composition providing a carbon to silicon ratio of about 1.57:1.

4,536,380

PROCESS FOR CONDUCTING REACTIONS USING A CIRCULATING MAGNETICALLY STABILIZED BED TO CONTROL REACTION TEMPERATURE PROFILE

James C. Pirkle, Jr., Lebanon; Angelo A. Montagna, Summit, and Philip A. Ruziska, Chester, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 15, 1982, Ser. No. 449,996
Int. Cl.³ C01C *1/04;* C07D *301/22*
U.S. Cl. 423—359 16 Claims



1. A process for conducting an endothermic or exothermic chemical reaction in a reactor comprising:

(a) subjecting a flowable bed containing magnetizable particles to an applied magnetic field having a substantial component along the direction of the external force field within the bed;

(b) circulating a reaction fluid through the reactor in a plug-flow manner at a rate such that the fluid exerts pressure against and levitates the particles in the bed and under conditions such that an endothermic or exothermic reaction takes place in the presence of the bed;

(c) circulating the bed of particles through the reactor in a plug-flow manner, and after its exit from the reactor, recirculating the bed to the reactor, the circulating and recirculating of the bed being conducted at a rate such that the temperature profile of the bed and reaction fluid throughout the entire contact of the bed with the reaction fluid is at or about the temperature profile which results in maximization, at each position in the reactor, of at least one of the following: conversion, selectivity or product yield; and

(d) recovering one or more reaction products.

4,536,381

PROCESS FOR THE REMOVAL OF H_2S AND ADJUSTMENT OF THE H_2/CO RATIO IN GASEOUS STREAMS CONTAINING HYDROGEN SULFIDE, CARBON MONOXIDE, AND HYDROGEN

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

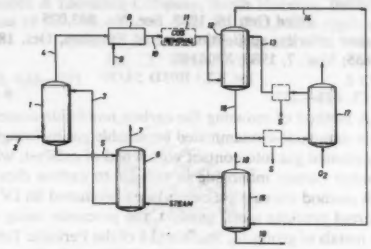
Filed Dec. 20, 1983, Ser. No. 563,478
Int. Cl.³ C01B *31/20, 3/16;* B01D *53/34*
U.S. Cl. 423—437 7 Claims

1. A process comprising

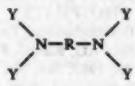
(a) contacting a gaseous stream containing H_2, CO, and H_2S with an H_2S-selective absorbent in an absorption zone and absorbing the bulk of the H_2S in said stream, producing a partially purified gas stream with water and containing a minor portion of H_2S;

(b) contacting at least a portion of the partially purified gas stream with a water shift catalyst under conditions to react CO and water in a conversion zone, and converting CO and water to H_2 and CO_2, and producing a modified gas stream having increased ratio of H_2 to CO and a minor portion of H_2S;

(c) passing modified gas stream to a contacting zone and



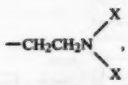
contacting modified gas stream with an aqueous reactant solution, the solution containing an effective amount of a reactant comprising oxidizing polyvalent metal ions or a polyvalent metal chelate of an acid having the formula



wherein

from two to four of the groups Y are selected from acetic and propionic acid groups;

from zero to two of the groups Y are selected from 2-hydroxy ethyl, 2-hydroxy propyl, and



wherein X is selected from acetic acid and propionic acid groups; and

R is ethylene, propylene or isopropylene or alternatively cyclohexane or benzene where the two hydrogen atoms replaced by nitrogen atoms are in the 1,2 position; and mixtures thereof, and converting H_2S in said modified gas stream to sulfur and recovering a substantially sulfur-free gas modified stream having an increased ratio of H_2 to CO.

4,536,382

PROCESS FOR THE CONVERSION OF H_2S AND ADJUSTMENT OF THE H_2/CO RATIO IN GASEOUS STREAMS CONTAINING HYDROGEN SULFIDE, HYDROGEN, AND CARBON MONOXIDE

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 20, 1983, Ser. No. 563,479
Int. Cl.³ C01B *31/20, 3/16;* B01D *53/34*
U.S. Cl. 423—437 7 Claims

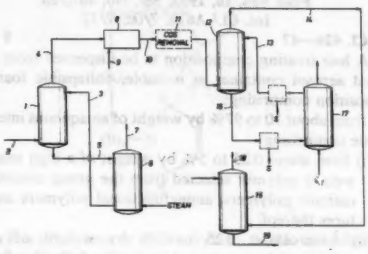
1. A process comprising

(a) contacting a gaseous stream containing H_2, CO, and H_2S with an H_2S-selective absorbent in an absorption zone and absorbing the bulk of the H_2S in said stream, producing a partially purified gas stream with water and;

(b) contacting at least a portion of the purified gas stream with a water shift catalyst under conditions to react CO and water in a conversion zone and converting CO and water to H_2 and CO_2, and producing a modified gas stream having increased ratio of H_2 to CO and a minor portion of H_2S;

(c) passing modified gas stream to a contacting zone, and contacting modified gas stream in the contacting zone with

an aqueous reactant solution, the solution containing an effective amount of an oxidizing polyvalent metal chelate of nitrilotriacetic acid, and mixtures thereof, and converting



H_2S in the modified gas stream in the contacting zone to sulfur and recovering a substantially sulfur-free gas modified stream having an increased ratio of H_2 to CO.

4,536,383

METHOD FOR PREPARATION OF ALKALI METAL SELENATES

Lothar Kaufmann, Hennef, and Klaus-Dieter Hellwig, Bad Honnef, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,326

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338893

Int. Cl.³ C01B *19/00*

U.S. Cl. 423—508 **11 Claims**

1. The method for the preparation of alkali metal selenates comprising

providing 4 to 6 mols hydrogen peroxide per mol of selenium in the form of a 30 to 50 weight percent hydrogen peroxide solution as a reaction medium, heating said hydrogen peroxide to a temperature of 30° to 100° C., adding the selenium in a powdered form at such a dosing rate such that the selenim powder floats outwardly from the point of introduction on the quiet surface of said reaction medium in a reaction zone having a peripheral wall, dissolving the selenium powder in this area of the surface of the reaction medium before reaching said peripheral wall the complete dissolution of the last selenium particles, permitting the reaction medium to undergo further reaction until evolution of gas ceases

then after stirring adding alkali metal hydroxide or carbonate in an initial neutralization step added at a temperature of 80° to 100° C. until a pH of 0.5 to 5 is obtained,

elevating the temperature of the reaction medium to 30° to 100° C. with the addition of 0.5 to 1 mol hydrogen peroxide per mol of selenium in the form of a 30 to 50 weight percent hydrogen peroxide solution,

maintaining the temperature at 90° to 100° C. until cessation of gas evolution and

neutralizating the selenic acid,

and isolating the salt obtained thereby.

4,536,384

STABLE SOLUTIONS OF BASIC ALUMINIUM SULPHATE CONTAINING POLYNUCLEATE ALUMINIUM HYDROXIDE SULPHATE COMPLEXES

Gertrud M. Lindahl, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Apr. 9, 1984, Ser. No. 598,365

Claims priority, application Sweden, Apr. 28, 1983, 8302386

Int. Cl.³ C01F *7/74, 7/02*

U.S. Cl. 423—556 **4 Claims**

1. A stable solution of basic aluminium sulphate containing polynucleate aluminium hydroxide sulphate complex and a stabilizing agent, characterized in that the stabilizing agent comprises an effective quantity of nitrilotriacetic acid, diethylene triaminopentaacetic acid or gallic acid.

4,536,385

METHOD AND APPARATUS FOR THE PRODUCTION OF INDUSTRIAL LEAD OXIDE

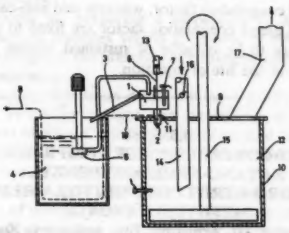
Rainer Heubach, Goslar; Reinhard Marx, Bad Harzburg; Peter Kunz, Goslar, and Dieter Hauke, Vienenburg, all of Fed. Rep. of Germany, assignors to Goslarer Farbenwerke Dr. Hans Heubach GmbH & Co. KG, Langelsheim, Fed. Rep. of Germany

Continuation of Ser. No. 258,013, Apr. 27, 1981, abandoned. This application Feb. 16, 1983, Ser. No. 467,090

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016984

Int. Cl.³ C21C *7/00*

U.S. Cl. 423—621 **4 Claims**



1. A one-stage continuous method for the direct production of industrial lead oxide, wherein molten lead is continuously fed into a reactor and is stirred therein at a pre-determined reaction temperature greater than 500° C. up to 640° C., and the resulting reaction product is drawn off continuously, and wherein the product exhibits a PbO content of substantially more than 99%, comprising

feeding the lead flow in a constant and even manner by introducing the molten lead into the reactor at a temperature close to and not more than 50° C. lower than the pre-determined reaction temperature, via a nozzle from a vessel in which the molten lead level is held constant, and

maintaining the reaction temperature level within ±5° C. of the pre-determined reaction temperature, said reaction temperature level being maintained by maintaining a continuous flow of heated air to said reactor at a substantially constant rate and, when said temperature level varies, correcting said temperature by slightly varying only the air flow.

4,536,386

METHOD OF CONTROLLING EMESIS CAUSED BY CISPLATIN IN CANCER CHEMOTHERAPY

Robert E. Keenan, Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 352,728, Feb. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 228,514, Jan. 26, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 508,367

Int. Cl.³ A61K *33/24, 31/165*

U.S. Cl. 424—10 **7 Claims**

1. A method for alleviating emesis in human cancer patients caused by cisplatin chemotherapy which comprises administering about 5 to 18 mg of metoclopramide or a pharmaceutically acceptable salt thereof per kg of patient body weight over a period of time spanning about 30 minutes prior to cisplatin administration through the post administration period, said metoclopramide or the pharmaceutically acceptable salt

thereof being administered either continuously or as 4 to 7 individually spaced dosages about 1½ to 3 hours apart.

4,536,387

ANTI-CANCER DEVICE

Izumi Sakamoto, and Kunihiko Takagi, both of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Feb. 14, 1983, Ser. No. 466,190

Claims priority, application Japan, Feb. 12, 1982, 57-21924; Nov. 8, 1982, 57-197147

Int. Cl.³ A61K *9/22, 9/26, 9/70;* A61L *15/03*

U.S. Cl. 424—14 54 Claims

1. A method of transcatheter arterial embolization and needle therapy comprising injecting a patient with composition useful for transcatheter arterial embolization and needle therapy comprising:

(a) a polymer, wherein said polymer has fixed thereto;

(b) an anti-cancer drug; and

(c) a blood coagulation factor, wherein said anti-cancer drug and said blood coagulation factor are fixed to said polymer so as to be capable of sustained release from the polymer at the site of injection.

4,536,388

PEST CONTROL DEVICE COMPRISING α-CYANO-3-PHENOXYBENZYL 2-(2-CHLORO-4-TRIFLUOROMETHYLANILINO)-3-METHYLBUTANOATE

Robert C. Pearce, III, Arlington, Tex., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Jul. 18, 1983, Ser. No. 514,738

Int. Cl.³ A61K *13/00;* A01N *37/34, 37/00, 43/36*

U.S. Cl. 424—28 11 Claims

1. A pest control device for attachment to an animal which comprises a plasticized polyvinyl halide resin matrix having dispersed therein a pesticidally effective amount of the compound α-cyano-3-phenoxybenzl 2-(2-chloro-4-trifluoromethylanilino)-3-methylbutanoate wherein the polyvinyl halide resin matrix is present in the amount from about 35% to about 75% by weight of the total composition, the plasticizer is present in the amount of from about 25% to about 45% by weight of the total composition and the pesticide is present in the amount of from about 1% to about 20% by weight of the total composition.

9. A method for controlling pests on animals which comprises attaching to said animal a pest control device of claim 1.

4,536,389

BACTERICIDAL TABLETTING COMPOSITION AND TABLETS FORMED THEREFROM

Christopher D. White, Richmond, and Alan A. Levy, Stanmore, both of England, assignors to Richardson-Vicks Ltd., Egham, England

Filed Sep. 19, 1983, Ser. No. 533,762

Claims priority, application European Pat. Off., Oct. 12, 1982, 82109431.5

Int. Cl.³ A61K *9/46*

U.S. Cl. 424—44 4 Claims

1. A tablet formed without a lubricant comprising:

dichloroisocyanuric acid or alkali metal salt thereof: 10–40% weight

carbonate as alkali metal bicarbonate or a mixture of alkali metal bicarbonate and carbonate: 20–50% weight

characterized in that the composition also has present 20 to 50% weight succinic acid powder having a particle size such that a maximum of 2% weight is retained on a 400 micron screen and no more than 25% weight passes through a 100 micron screen.

4,536,390

COLLAPSIBLE FOAM AEROSOL HAIR PRODUCT

Timothy J. Padden, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Feb. 18, 1983, Ser. No. 467,725

Int. Cl.³ A61K *7/06, 9/12*

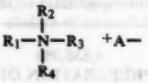
U.S. Cl. 424—47 9 Claims

1. A hair treating composition to be dispensed from a pressurized aerosol container as a stable, collapsible foam, said composition comprising:

A. from about 10 to 97% by weight of an aqueous intermediate comprising:

(i) from about 0.25 to 5% by weight of a high molecular weight polymer selected from the group consisting of cationic polymers, aminefunctional polymers and mixtures thereof;

(ii) from about 0.25 to 2% by weight of quaternaryamonium compound having the following formula:



Wherein R_1, is a alkyl group having from 8 to 16 carbon atoms, a mixture of alkyl groups having an average chain length of from 8 to 16 carbon atoms or tallow if R_2 is a group having the formula $[CH_2—CH_2—O]_nH$, R_2 is an alkyl group having from 8 to 16 carbon atoms, a mixture of alkyl groups having an average carbon atom chain length of from 8 to 16 carbon atoms, an alkyl group having from 1–4 carbon atoms, a group having the formula $[CH_2—CH_2—O]_nH$, wherein $_n$ is a number from 2 to 16 and mixtures thereof, R_3 is an alkyl group having from 1 to 4 carbon atoms, a group having the formula $[CH_2—CH_2—O]_n—H$, wherein $_n$ is a number from 2 to 16 and mixtures thereof, R_4 is an alkyl group having 1 to 4 carbon atoms, benzyl and mixtures thereof and A is an anion;

(iii)and the balance water; and

(B) from about 90 to 3% by weight of a propellant and

(C) less than 10% alcohol having 1–4 carbon atoms, whereby said composition is essentially alcohol free.

4,536,391

PROCESS FOR PREPARING UROKINASE COMPLEX

Wasei Miyazaki; Tsuneo Sato; Yasuo Nakayama, and Tadao Sato, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Japan

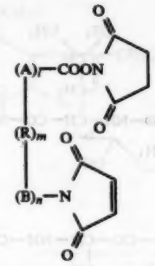
Filed Nov. 15, 1983, Ser. No. 551,841

Claims priority, application Japan, Nov. 17, 1982, 57-202359; Apr. 28, 1983, 58-75198

Int. Cl.³ A61K *37/48, 37/00;* C07G *7/00;* C12N *9/72*

U.S. Cl. 424—94 17 Claims

1. A plasmin heavy chain urokinase complex prepared by a process comprising reacting a plasmin heavy chain with urokinase in the presence of a protein coupling reagent represented by the formula



wherein R is phenylene or cycloalkylene, A is lower alkylene, B is lower alkylene which may optionally be substituted by lower alkylthio or phenyl-lower alkylthio, and l, and m and n are each 0 or 1 provided that l, m and n are not 0 at the same time.

17. A pharmaceutical composition for treating thrombosis containing the plasmin heavy chain-urokinase complex as defined in claim 1 in an amount effective for treating thrombosis in combination with a pharmaceutically acceptable, nontoxic carrier.

4,536,392

METHOD FOR CONTROLLING HEMOPHILIA IN MAMMALS

Alan R. Giles, Kingston, Canada, and Kenneth G. Mann, Rochester, Minn., assignors to Queen's University at Kingston, Kingston, Canada

Filed Jun. 27, 1983, Ser. No. 508,213
Int. Cl.³ A61K *35/16*
U.S. Cl. 424—101 **6 Claims**

1. A method for controlling hemophilia in mammals comprising administering intravenously to a hemophilic said mammal a synergistic mixture of phospholipid vesicles and mammalian blood factor Xa in relative proportion and in an amount just sufficient to arrest bleeding.

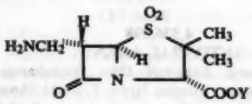
4,536,393

6-(AMINOMETHYL)PENICILLANIC ACID 1,1-DIOXIDE ESTERS AND INTERMEDIATES THEREFOR

Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

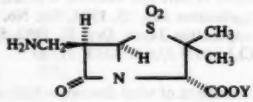
Continuation-in-part of Ser. No. 501,451, Jun. 6, 1983, abandoned. This application Feb. 6, 1984, Ser. No. 577,478
Int. Cl.³ C07D *499/00*; A61K *31/425*
U.S. Cl. 424—114 **17 Claims**

1. A beta-lactam ester of the formula



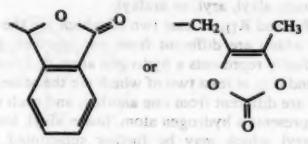
(I)

or



(II)

wherein Y is



or a pharmaceutically acceptable acid addition salt thereof.

4,536,394

ACTIVATED SILICON-CONTAINING ALUMINUM COMPLEX AND PROCESS OF PREPARATION AND USE

Fred B. Bernat, Cliffside Park, N.J., assignor to San-Mar Laboratories, Inc., Elmsford, N.Y.

Filed Apr. 26, 1983, Ser. No. 488,637
Int. Cl.³ A61K *33/06*
U.S. Cl. 424—154 **18 Claims**

1. A process for preparing a suspension of an activated silicon aluminum complex which is capable of releasing oxygen and hydrogen in the presence of a halogen compound, said process comprising:

(a) contacting aluminum metal having a purity of at least about 99.9% by weight and containing at least trace amounts of silicon, with a source of an acid of a type and concentration which will both remove and inhibit the formation of oxide on said metal;

(b) contacting said acid-treated aluminum metal with a source of mercury in an oxygen-containing atmosphere;

(c) partially immersing said mercury contacted aluminum in a hydrogen halide solution for sufficient time to begin the growth of a complex on said mercry-contacted aluminum;

(d) treating said complex with acid to increase the pH to such an extent that the halogen which is contained in said complex is neither chemically bound as a halide nor liberated as a halogen gas;

(e) adding a source of oxygen gas to said acid treated complex solution in an amount which depends upon the desired amount of oxygen gas to be released from the final activated silicon aluminum complex;

(f) drying said oxygenated and acid treated complex;

(g) at least partially redissolving said complex in a hydrogen halide acid solution to form a suspension;

(h) cooling said suspension; and

(i) increasing the pH of said suspension to from about 5.0 to about 5.8.

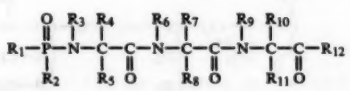
4,536,395

AMINO ACID DERIVATIVES AND ANTIHYPERTENSIVE DRUGS CONTAINING THEM

Shumpei Sakakibara, Suita; Yasumi Yugari, Kamakura, and Shigebumi Hashimoto, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 458,844, Jan. 18, 1983,. This application Jul. 14, 1983, Ser. No. 513,738
Claims priority, application Japan, Jan. 23, 1982, 57-9341; Aug. 16, 1982, 57-141831
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 514—7 **14 Claims**

1. An amino acid derivative represented by the formula:



wherein:

R_1 and R_2 are the same or different from each other, and

each individually represents hydroxy, alkyloxy, aryloxy, aralkyoxy, alkyl, aryl, or aralkyl;

R_3, R_5, R_8, and R_{11}, at least two of which are the same, or all of which are different from one another, and each individually represents a hydrogen atom or lower alkyl;

R_4, R_7, and R_{10}, at least two of which are the same, or all of which are different from one another, and each individually represents a hydrogen atom, lower alkyl, lower aryl, or benzyl which may be further substituted by OH, COOH, amino, carbamoyl, guanidino, imidazolyl, indolyl, mercapto, or alkylthio;

R_6 and R_9 are the same or different from each other, and each individually represents hydrogen atom, lower alkyl, lower aryl, or benzyl;

R_{12} represents hyroxyl, alkyloxy, aryloxy, aralkyloxy, amino, mono- or di-alkyl-, aryl-, or aralkylamino; and

R_6 and R_7 combined together, and R_9 and R_{10} combined together, may independently form an alkylene bridge having 2 to 4 carbon atoms, which may further contain a double bond, or be further substituted by hydroxyl.

4,536,396

SYNERGISTIC SWEETENING COMPOSITIONS

Charles R. Stephens, Jr., Niantic, and Anibal Torres, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,801

Int. Cl.[3] **A61K** *37/02, 9/68;* **A23L** *1/236;* **A23G** *3/30*

U.S. Cl. 514—2 **22 Claims**

1. A method of masking the bitter taste and enhancing the sweet taste of 6-methyl-1,2,3-oxathiazin-4(3H)-one-2,2-dioxide, or an edible cationic salt thereof, in a composition for oral use which comprises combining in said composition 0.5 to 20 parts by weight of 3-(L-aspartyl-D-alanamido)-2,2,4,4-tetramethylthietane or an edible salt thereof for each 99.5 to 80 parts by weight of said oxathiazine or salt thereof, the sum of the parts by weight equalling 100, in total amounts which produce the desired sweetness in said composition.

4,536,397

ANTIBIOTICS, NEOVIRIDOGRISEINS, AND THEIR METHOD OF PRODUCTION

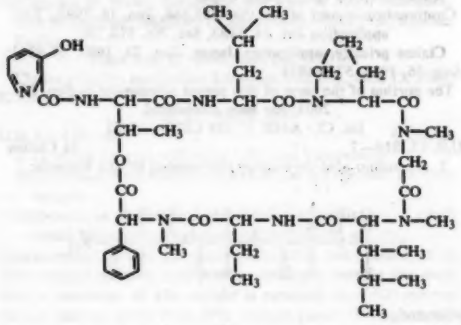
Yasushi Okumura; Kazuhiko Okamura; Yasuo Fugakawa; Tomoyuki Ishikura, all of Kanagawa; Kageaki Kouno, Tokyo, all of Japan, and Joseph Lein, Fayetteville, N.Y., assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan and Panlabs, Inc., Fayetteville, N.Y.

Division of Ser. No. 333,950, Dec. 23, 1981, Pat. No. 4,456,592, which is a division of Ser. No. 803,922, Jun. 6, 1977, Pat. No. 4,355,112. This application Oct. 31, 1983, Ser. No. 547,155

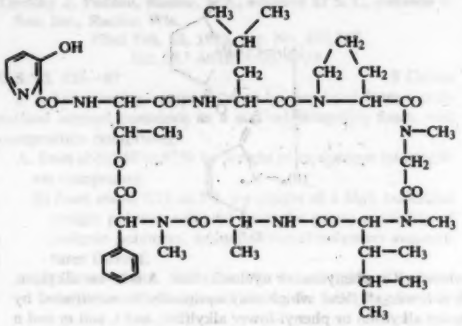
Int. Cl.[3] **A61K** *37/00;* **C12P** *21/04*

U.S. Cl. 514—11 **5 Claims**

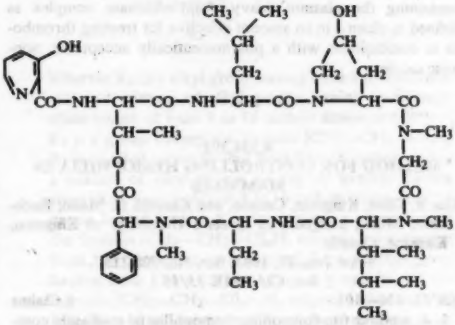
1. A process for preparing depsipeptide antibiotic neoviridogrisein I of the formula



depsipeptide antibiotic neoviridogrisein II of the formula



depsipeptide antibiotic neoviridogrisein III of the formula



which comprises cultivating Streptomyces sp. P 8648 (FERM-P3562; ATCC 31289) under aerobic conditions, at a temperature between 18° and 37° C., in an aqueous nutrient medium containing assimilable sources of carbon, assimilable sources of nitrogen, and essential mineral salts, at a pH between about 6 and about 9, until a substantial antibiotic activity is imparted to the medium, recovering the fermentation product from the medium and, optionally, isolating neoviridogrisein I, neoviridogrisein II and neoviridogrisein III as the single components.

4,536,398

ANTIVIRAL AGENTS

Tatsuo Ito, Isehara; Kazunori Oba, Yokohama; Harumi Fukuyasu, Yokosuka; Tomizo Niwa; Takashi Shomura, both of Yokohama, and Yuzo Kazuno, Hachioji, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

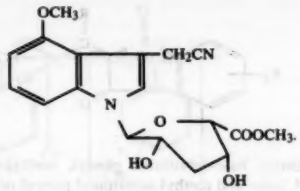
Continuation-in-part of Ser. No. 544,448, Oct. 21, 1983, abandoned. This application Jun. 25, 1984, Ser. No. 624,786

Claims priority, application Japan, Oct. 28, 1982, 57-188116

Int. Cl.[3] **A01N** *31/00;* **A61K** *31/70*

U.S. Cl. 514—43 **2 Claims**

1. A method for treatment of viral diseases which comprises administering a pharmaceutically effective amount of a substance SF-2140 represented by the following formula:



4,536,399

USE OF FUMED SILICA FOR TREATING OILY SKIN AND ACNE

Robert G. Flynn; Courtney G. Pitkin, both of St. Louis, and Gregory A. Hileman, Hazelwood, all of Mo., assignors to Norcliff Thayer, Inc., Tarrytown, N.Y.

Continuation-in-part of Ser. No. 434,039, Oct. 13, 1982,. This application Feb. 9, 1984, Ser. No. 578,725

Int. Cl.³ A61K *31/60, 31/075, 31/695*

U.S. Cl. 514—63 **6 Claims**

1. A composition for application to oily skin consisting essentially of by weight:

1–10% fumed silica consisting of 99.8% silicone dioxide on an ignited weight basis and capable of absorbing about 4 gm of squalene oil per gm, in an oil-in-water emulsion carrier,

said carrier consisting of

1–4% of a thickening agent/emollient selected from the group consisting of cetyl alcohol, stearic acid and glycerol monostearate,

0.25–1.5% sodium lauryl sulfate emulsifier and water q.s. 100%.

4,536,400

PHOSPHONOFORMIC ACID ESTERS

Åke J. E. Helgstrand; Karl N. G. Johansson, both of Enhörna; Alfons Misiorny, Bandhagen; Jan O. Norén, Grödinge, and Göran B. Stening, Södertälje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

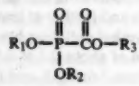
Division of Ser. No. 93,166, Nov. 13, 1979, Pat. No. 4,372,894, which is a continuation-in-part of Ser. No. 971,689, Dec. 21, 1978, abandoned. This application Sep. 10, 1982, Ser. No. 416,632

Claims priority, application United Kingdom, Dec. 22, 1977, 53580; Dec. 22, 1977, 53581; Dec. 22, 1977, 53582; Dec. 22, 1977, 53583; Jul. 3, 1978, 28548; Jul. 3, 1978, 28552; Jul. 3, 1978, 28553; Jul. 3, 1978, 28555

Int. Cl.³ A61K *31/66, 31/685*

U.S. Cl. 514—120 **44 Claims**

1. A pharmaceutical preparation for the treatment of viral infections in animals including man comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of the active ingredient a compound of the formula



(I)

wherein one of R_1 and R_2 is H and the other of R_1 and R_2 is a phenyl group of the formula

(II)

wherein R_4 and R_5 are the same or different and each is selected from the group consisting of hydrogen, halogen, alkyl having 1, 2, or 3 carbon atoms, alkoxy having 1, 2, or 3 carbon atoms, alkoxycarbonyl having 2–7 carbon atoms; and alkylcarbonyl groups having 2–7 carbon atoms; or R_4 and R_5 together form a straight saturated alkylene chain having 3 or 4 carbon atoms and being bound to adjacent positions, i.e. 2,3− or 3,4− in the phenyl ring and R_3 is H; and physiologically acceptable salts and optical isomers thereof.

4,536,401

11β-ARYL ESTRADIENES, PROCESSES FOR THEIR PRODUCTION AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Guenter Neef; Gerhard Sauer; Rudolf Wiechert; Helmut Hofmeister; Ralph Rohde; Klaus Annen; Henry Laurent; Sybille Beier; Wolfgang Losert; Walter Elger, and David Henderson, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

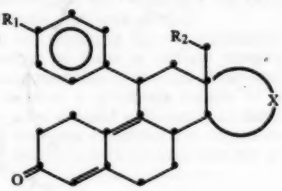
Filed Feb. 21, 1984, Ser. No. 581,853

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3306121; Feb. 18, 1983, 3306124

Int. Cl.³ A61K *31/58*

U.S. Cl. 514—173 **26 Claims**

1. An 11β-aryl estradiene of Formula I

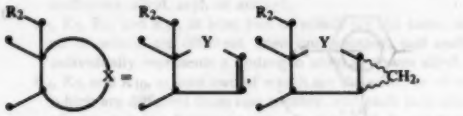


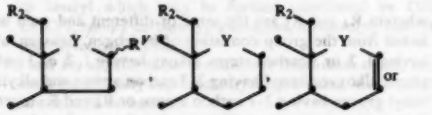
(I)

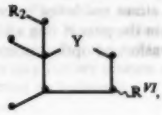
wherein R_1 is

wherein R^I and R^{II} each independently is alkyl of 1–4 carbon atoms, or R^I and R^{II} together with the connecting N-atom form a 5- or 6-membered hererocyclic ring whose remaining atoms are all C-atoms, or which also includes an additional N-atom, an additional O or S atom or a combination thereof;

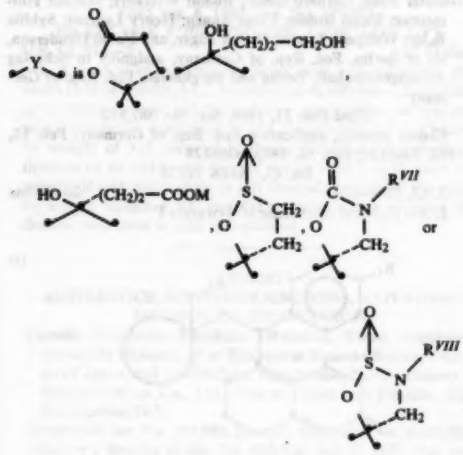
wherein R^I and R^{II} are as defined above; —SR^{III}, wherein R^{III} is methyl, ethyl or phenyl; or —OR^{IV}, wherein R^{IV} is methyl, ethyl, propyl, methoxymethyl, allyl, or β-dimethylaminoethyl; R_2 is hydrogen, methyl, or ethyl;







wherein the wavy lines ~~~~ mean that the substituent is in the α- or β-position, and



M is Na, K or Li; and R^V, R^{VI}, R^{VII} and R^{VIII} each independently is alkyl of 1–4 carbon atoms.

23. A pharmaceutical composition comprising an amount of a compound of claim 1 effective to cause an abortion and a pharmaceutically acceptable carrier.

4,536,402

VINYLOGOUS CARBOXAMIDES

Wolfhard Engel; Eckhart Bauer, both of Biberach; Günter Trummlitz, Warthausen; Peter Danneberg, Ockenheim, and Joachim Kühling, Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach, Fed. Rep. of Germany

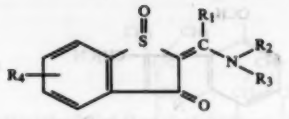
Continuation-in-part of Ser. No. 478,673, Mar. 25, 1983. This application Nov. 29, 1984, Ser. No. 676,067

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212752

Int. Cl.³ A61K *31/44, 31/38;* C07D *333/52*

U.S. Cl. 514—443 **8 Claims**

1. A compound of the formula



wherein

R_1 is phenyl, halo-substituted phenyl, methyl-substituted phenyl, halo- and methyl-substituted phenyl or pyridinyl;

R_2 is hydrogen, straight or branched alkyl of 1 to 4 carbon atoms, 2- or 3-hydroxy-(alkyl of 2 to 3 carbon atoms) or 2- or 3-dimethylamino-(alkyl of 2 to 3 carbon atoms);

R_3 is hydrogen or alkyl of 1 to 3 carbon atoms; and

R_4 is hydrogen, chlorine or methyl.

4,536,403

METHOD FOR TREATING NEUROLEPTIC INDUCED TARDIVE DYSKINESIA

J. F. Girard Rooks, 3181 Prairie St., P.O. Box 303, Grandville, Mich. 49418

Filed Jun. 6, 1984, Ser. No. 617,774

Int. Cl.³ A61U *31/27*

U.S. Cl. 514—483 **6 Claims**

1. A method of treating tardive dyskinesia induced by treatments with a neuroleptic drug, which comprises orally administering internally to a human patient suffering from tardive dyskinesia a therapeutically effective amount of carisoprodol.

4,536,404

METHOD AND COMPOSITION FOR TREATING POST-HERPETIC NEURALGIA

Joel E. Bernstein, Deerfield, Ill., assignor to Dermatological Enterprises, Ltd., Northbrook, Ill.

Filed Jun. 16, 1983, Ser. No. 504,963

Int. Cl.³ A61K *31/165, 35/78*

U.S. Cl. 416—627 **7 Claims**

1. A method of treating post-herpetic neuralgia due to herpes zoster in a patient having herpes zoster comprising topically applying an effective amount of capsaicin in a pharmaceutically acceptable carrier to the area affected with herpes zoster for a time sufficient to relieve the symptoms of post-herpetic neuralgia due thereto.

4,536,405

MAKE-UP COSMETICS COMPOSITION

Michiko Nara, Tokyo; Kazunori Yamazaki, Kanagawa, and Yasuko Akiyama, Tokyo, all of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

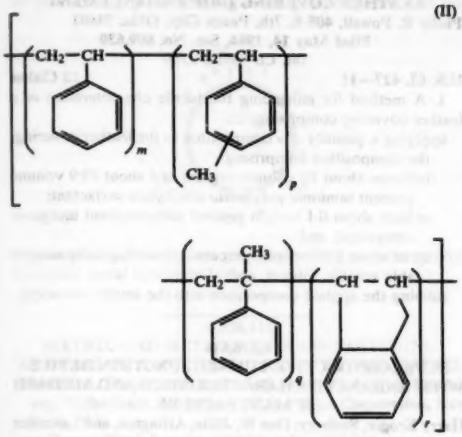
Continuation of Ser. No. 891,778, Sep. 17, 1979, abandoned. This application Sep. 17, 1979, Ser. No. 75,762

Claims priority, application Japan, Aug. 26, 1977, 52-102213

Int. Cl.³ A61K *7/025, 7/027, 7/032, 47/00*

U.S. Cl. 514—781 **11 Claims**

1. A make-up cosmetic composition containing one or more volatile liquid oils, waxes and pigments and further at least one of (a) an organo-soluble ethyl hydroxyethyl cellulose having a hydroxy ethoxyl degree of substitution of about 0.3 to 0.9 and an ethoxyl degree of substitution of about 2.6 to 2.9, and (b) an aromatic hydrocarbon resin having a softening point of at least about 120° C. said aromatic hydrocarbon resin being represented by the following formula (II)



(II)

wherein m, p, q and r are positive integers.

4,536,406

RED COLORED MEAT ANALOG

Rita W. Brander, New Rochelle, N.Y.; John E. Hammond, Glen Rock, N.J., and John H. Pasch, Putnam Valley, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 8, 1984, Ser. No. 587,478
Int. Cl.[3] A23J *3/00*; A23L *1/275*
U.S. Cl. 426—104 14 Claims

1. A meat analog comprising soy isolate and coloring amounts of laccaic acid and paprika, wherein said paprika is present in amounts effective to render said soy isolate non-reactive to the laccaic acid.

4,536,407

FUNCTIONAL PROTEIN PRODUCTS

Lucas K. Shay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 29, 1983, Ser. No. 518,593
Int. Cl.[3] A23D *5/00*; A23J *3/00*; A23L *1/27*
U.S. Cl. 426—250 31 Claims

17. The process of preparing a functional protein product by the steps comprising:

(a) base-treating nucleic acid-containing microbial yeast cells as an aqueous suspension of about 10 to 25 weight percent cells with ammonium or alkali metal hydroxide at a pH of about 9 to 9.5, a temperature of about 90° to 95° C., for a time of about 20 to 40 minutes,

(b) water-washing the base-treated cells,

(c) acid-treating the washed base-treated cells as an aqueous suspension of about 10 to 25 weight percent cells with sulfuric acid at a pH of about 3 to 5 for about 20 to 50 minutes at a temperature of about 80° to 95° C.,

(d) water-washing the acid-treated base-treated cells,

(e) creaming the acid-treated base-treated microbial yeast cells by admixing with sufficient water to prepare a cream containing about 10 to 25 weight percent cells, and

thereby preparing a functional protein product.

4,536,408

LOW FAT SPREAD

Alpha L. Morehouse, and Charles J. Lewis, both of Muscatine, Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

Filed Sep. 12, 1983, Ser. No. 531,752
Int. Cl.[3] A23D *3/00, 3/02*; A23L *1/27*
U.S. Cl. 426—250 19 Claims

1. A low fat spread comprising a blend of an edible fat suitable for butter substitutes, a non-gelled starch hydrolyzate having a D.E. of about 4 and not more than 25 and water, such blend being a water-in-oil emulsion and having the approximate consistency of natural butter at room temperature wherein the edible fat is employed in an amount of from about 15 to 35% by weight of the spread and the starch hydrolyzate is employed in an amount of from about 15 to 35% by weight of the spread.

4,536,409

OXYGEN SCAVENGER

Christopher J. Farrell, Arlington Heights, and Boh C. Tsai, Rolling Meadows, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Jan. 23, 1981, Ser. No. 228,089
Int. Cl.[3] A23B *00/00*; B32B *27/08*
U.S. Cl. 426—398 125 Claims

1. A polymeric laminate having only solid layers which comprises:

a. at least one polymeric protective layer in protective relation to an oxygen scavenger material in another layer of the laminate, and

b. a polymeric layer having incorporated therein a dry oxygen scavenger material, the material being capable of a passive state for prolonged periods of time during which the oxygen scavenger will not directly react with oxygen, and triggerable to an active state when wetted with water which has selectively permeated the protective layer from outside the laminate, whereupon the oxygen scavenger will directly react with oxygen,

wherein said protective layer is substantially resistant to permeation by water at ambient temperature and has enhanced transmission of water at elevated temperatures and therefore is selectively capable of permeation by water at an elevated temperature to thereby selectively permit the water to contact said oxygen scavenger material to convert it from the passive to the active state.

4,536,410

DIPEPTIDE SWEETENER COMPOSITION

Nancy J. Vaccaro, Putnam Valley; John R. Frost, Beacon, both of N.Y.; Alfred C. Glatz, Stamford, Conn., and Timothy W. Schenz, Haworth, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sep. 12, 1983, Ser. No. 531,525
Int. Cl.[3] A23L *1/22*
U.S. Cl. 426—548 31 Claims

1. A dipeptide sweetener-lipid gel composition consisting essentially of, by weight;

(a) one part hydrated, crystalline, dipeptide sweetener containing water of crystallization, wherein said hydrated dipeptide sweetener comprises between about 0.02 and about 1.0 parts water per part dipeptide sweetener; and

(b) about 1 to about 100 parts lipid per part dipeptide sweetener wherein said lipid is selected from the group consisting of aliphatic acids, aliphatic acid esters and combinations thereof and said dipeptide sweetener-lipid composition is effective to form a gel which is thermally irreversible.

18. A process for producing a thermally sible, aspartamelipid gel comprising the steps of:

(a) combining ingredients consisting essentially of 1 part hydrated, crystalline aspartame containing water of crys-

tallization, wherein said aspartame sweetener comprises between about 0.02 and about 1 part water per part aspartame, with between about 1 and about 100 parts lipid; and

(b) heating the aspartame-lipid admixture to a temperature between about 25° C. and the temperature at which the lipid decomposes for a time effective to produce a viscosity increase of at least about 100%.

4,536,411

SPREAD HAVING BUTTER-LIKE PROPERTIES

Douglas C. Kirton, Nutley nr Uckfield; Avril B. MacNeill, Gravesend, both of England, and Laurentius A. M. Verhagen, Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,916

Claims priority, application United Kingdom, Nov. 22, 1982, 8233217

Int. Cl.³ A23D *5/02*

U.S. Cl. 426—603 **15 Claims**

1. A process for the preparation of a fat-continuous spread, comprising:

(a) producing a proteinaceous oil-in-water emulsion cream comprising from 10 to 40% by weight of a dispersed fatty phase containing a primary fat selected from the group consisting of hydrogenated palmkernel-, coconut-, babassu-, ouricurum-, murumuru-, tucum oil, palm oil and oils hydrogenated under conditions promoting isomerism and forming of triglycerides in the trans-configuration and having a melting point from 30° to 70° C., wherein said dispersed fatty phase constitutes less than 20% by weight of the total amount of fat present in the spread;

(b) emulsifying said cream with a secondary fat constituting the continuous phase of said spread and having a melting point equal to or less than the melting point of said primary fat;

(c) subjecting the emulsion obtained in (b) to a texturizing treatment involving cooling and working;

(d) heating at least part of the texturized emulsion to a temperature of from 40° to 70° C. mixing said heated texturized emulsion with fresh emulsion obtained in (b) and subjecting the resulting emulsion mixture to the texturizing treatment of step (c) to obtain a fat-continuous spread.

4,536,412

METHOD OF PRODUCING PROTEIN-RICH FORAGE OR NITROGENOUS FERTILIZER FROM FOWL DROPPINGS, SWINE DUNG, COW DUNG AND THE LIKE

Shuzo Nakazono, 5-9-901, 2 chome Arato, Chuo-ku, Fukuoka, Japan

Filed Jan. 5, 1982, Ser. No. 337,123

Int. Cl.³ A23L *1/01*

U.S. Cl. 426—641 **4 Claims**

1. A method of producing protein-rich forage or nitrogenous fertilizer from a water containing ordure sludge of fowl droppings, swine dung, cow dung, or the like which comprises, charging a batch of said water containing ordure into a cooker containing an animal, fish or vegetable oil preheated to a temperature above 90° C. at which gelatinous substances and proteins in the ordure are not dissolved in the oil but are thermally coagulated, heating and stirring the mixture in said cooker while reducing the pressure in the cooker to a first reduced pressure of 10-20 mmHg for a period of about 30 minutes after charging to perform a first stage of dehydration and to thermally coagulate the gelatinous substances and proteins of the ordure, then further reducing the pressure in the cooker to a second reduced pressure while heating and stirring to cause the density of moisture in the mixture to become lower than the density of the oil to further remove moisture from ordure solids and the oil, then removing the thus treated material from the cooker and compressing the material to separate the oil from the solids.

4,536,413

LEATHER COVERING GRIP ENHANCEMENT

Philip R. Powell, 408 S. 7th, Ponca City, Okla. 74601

Filed May 14, 1984, Ser. No. 609,639

Int. Cl.³ B05D *1/00*

U.S. Cl. 427—11 **12 Claims**

1. A method for enhancing the tactile characteristics of a leather covering comprising:

applying a quantity of a composition to the leather covering, the composition comprising:

between about 10 volume percent and about 99.9 volume percent nonionic polymeric ethoxylate surfactant;

at least about 0.1 weight percent antiperspirant inorganic compound; and

up to about 89.9 volume percent dermatologically acceptable volatile solvent; and

rubbing the applied composition into the leather covering.

4,536,414

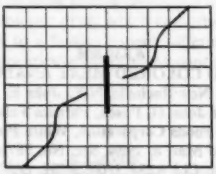
SUPERCONDUCTIVE TUNNEL JUNCTION DEVICE WITH ENHANCED CHARACTERISTICS AND METHOD OF MANUFACTURE

Harry Kroger, Sudbury; Don W. Jillie, Arlington, and Lawrence N. Smith, Lexington, all of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,241

Int. Cl.³ H01L *39/22*

U.S. Cl. 427—38 **4 Claims**



1. A method of manufacturing a superconductive tunnel junction device in a vacuum chamber comprising the steps of

pumping the vacuum system down to vacuum,

depositing a first layer of superconductive material on a substrate,

bombarding said first layer of superconductive material with inert gas ions, providing a bombarded first superconductive layer,

forming a barrier layer on said bombarded first superconductive layer,

said bombarding step being performed prior to forming said barrier layer,

said aforementioned steps being performed without breaking the vacuum system, and

completing said superconductive tunnel junction device.

4,536,415

METHOD OF MANUFACTURING AN OPTICALLY READABLE INFORMATION DISC

Theodorus H. G. Martens, and Franciscus H. M. Sanders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,196

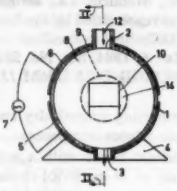
Claims priority, application Netherlands, Feb. 4, 1983, 8300422

Int. Cl.³ B05D *3/14*

U.S. Cl. 427—40 **3 Claims**

1. A method of manufacturing an optically readable information disc which comprises a disc-shaped substrate manufactured from a synthetic resin or comprising a coating layer of a synthetic resin and having on at least one surface thereof an optically readable structure of information areas situated alternatively at a higher level and at a lower level, characterized in that the substrate, on the surface having the optical structure,

is treated with an ion free, low-pressure high-frequency plasma of an oxidizing gas containing a halogen compound and the



thus treated surface is then provided with a non-electrolytic deposited metal reflection layer.

4,536,416

MATRIX AND METHOD OF MANUFACTURING ARTICLES OF A SYNTHETIC RESIN BY THE MATRIX

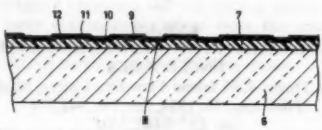
Johannes J. Ponjee, and Frederik B. Meigert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1983, Ser. No. 505,003

Claims priority, application Netherlands, Mar. 28, 1983, 8301070

Int. Cl.³ B32B *3/02*

U.S. Cl. 427—131 **5 Claims**



1. A method of improving the removability of a body comprising a pattern-bearing synthetic resin surface from a matrix comprising a metal surface bearing the negative of said pattern and contacting said synthetic resin surface during formation of said pattern on said synthetic resin surface, said method comprising coating said metal surface with a monolayer of a releasing agent selected from the group consisting of alkylmercaptans and fluoroalkylmercaptans prior to contacting said metal surface with said synthetic resin surface.

4,536,417

METHOD FOR REPAIRING AND RESTORING DETERIORATED CEMENT-CONTAINING INORGANIC MATERIAL

Toshihiko Shimizu, Narashino, Japan, assignor to Onoda Construction Materials Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1983, Ser. No. 560,014

Int. Cl.³ B32B *35/00*

U.S. Cl. 427—140 **4 Claims**

1. A method for repairing and restoring a deteriorated reinforced concrete, comprising the first step in which a solution of lithium silicate is applied to the surface of said reinforced concrete to infiltrate said solution into the body of said reinforced concrete, the second step in which the surface of the reinforced concrete which has undergone said first step treatment is topcoated with cement paste of the following composition (A), and the third step in which the surface of the cement paste coating formed in the second step is further coated with mortar of the following composition (B):

composition (A):

(a) cement: 40–60 parts

(b) aggregate smaller than 0.3 mm in size: 60–40 parts

(c) anion-polymerized styrene/butadiene rubber latex (solid content): 2–8 parts

compositon (B):

(a) cement: 20–40 parts

(b) aggregate smaller than 1.2 mm in size: 80–60 parts

(c) anion-polymerized styrene/butadiene rubber latex (solid content): 2–8 parts.

4,536,418

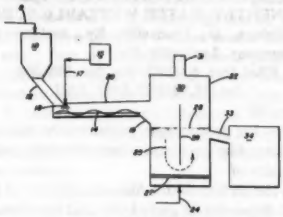
METHOD FOR TREATING POTASH WITH ANTICAKING AGENT

Elmar L. Goldsmith, Regina, Canada, assignor to PPG Industries Canada, Ltd., Regina, Canada

Filed Apr. 22, 1982, Ser. No. 370,767

Int. Cl.³ B05D *7/00*

U.S. Cl. 427—213 **18 Claims**



1. A method for uniformly distributing liquid anticaking agent onto the surface of particulate, hygroscopic material, which comprises applying an anticaking amount of an aqueous dispersion of anticaking agent to a stream of said particulate material while agitating said material, said agitation providing an initial distribution of anticaking agent on the particulate material, passing directly particulate material treated with anticaking agent through a fluidized bed of said treated particulate material, and removing from the fluidized bed particulate hygroscopic material having anticaking agent distributed substantially uniformly over the surface of the particles of the particulate material.

4,536,419

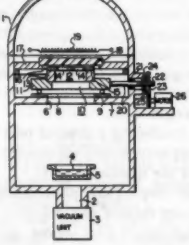
METHOD FOR FORMING TAPERED FILMS

Hitoshi Kubota, Fujisawa; Minoru Tanaka, and Susumu Aiuchi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 474,032

Int. Cl.³ C23C *11/00, 13/00*

U.S. Cl. 427—255.5 **14 Claims**



1. A method for producing multiple layers, including a tapered thin film as a lower layer thereof, on a substrate by dry process comprising:

using a mask having a pattern with a smaller dimension by a pattern difference than a desired pattern of the thin film,

said pattern having the smaller dimension at least in the direction of the taper to be formed;

carrying out a relative motion between said substrate and said mask disposed close to the substrate within the range of said desired pattern, in the direction of said taper to be formed;

forming a thin film on said substrate by vapor deposition in association with said relative motion to thereby produce a substantially-tapered, vapor-deposited thin film; and

forming at least one layer on said substantially-tapered, vapor-deposited thin film.

4,536,420

PROCESS AND COMPOSITION FOR PRODUCING PERMANENTLY WATER WETTABLE SURFACES

Milton E. Rickert, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 5, 1983, Ser. No. 558,306
Int. Cl.³ B05D *5/00, 3/02*
U.S. Cl. 427—257 **36 Claims**

1. A process for producing a permanently water wettable, abrasion-resistant film on a non-water-absorbing surface, consisting essentially of:

(a) coating the surface with a film of a mixture of an aqueous colloidal dispersion of carboxylic acid functional polymer which is curable to water insolubility, and an aqueous colloidal dispersion of surface hydroxylated silica, the silica solids being present in an amount sufficient to cause the formation of canals in the hardened film when the mixture is applied to the surface at a suitable thickness; and

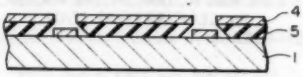
(b) hardening the film to provide a water insoluble polymer.

4,536,421

METHOD OF FORMING A MICROSCOPIC PATTERN

Toshiharu Matsuzawa, Higashimurayama; Kikuo Douta, Hachioji; Takao Iwayanagi, and Hiroshi Yanazawa, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,481
Claims priority, application Japan, Aug. 1, 1980, 55-104990
Int. Cl.³ B05D *1/32*; C23F *13/00*
U.S. Cl. 427—282 **17 Claims**



1. A method of forming a microscopic pattern, including:

(1) the step of depositing a film of a negative photoresist, said photoresist including a polymer having benzene rings, said film being a single layer, on a surface on which the microscopic pattern is to be formed, to form a photoresist film of said single layer,

(2) the step of irradiating a desired part of said photoresist film with short-wavelength ultraviolet radiation, to lower a solubility of the irradiated part,

(3) the step of developing said photoresist film, to remove an unirradiated part thereof and to form a photoresist pattern from said photoresist film whose sectional shape is an inverted trapezoid,

(4) the step of depositing a film of a material which is to form said microscopic pattern on the portion of said surface that is exposed by removal of said unirradiated part and on said photoresist pattern, and

(5) the step of removing said photoresist pattern along with the film of the material deposited thereon.

4,536,422

PROCESS TO IMPART SMOOTH-DRY AND FLAME RETARDANT PROPERTIES TO CELLULOSIC FABRIC

Robert J. Harper, Jr., Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 6, 1984, Ser. No. 586,617
Int. Cl.³ B05D *3/02*; D06M *13/34*
U.S. Cl. 427—381 **14 Claims**

1. A process for imparting smooth-dry and flame retardant properties to cellulosic fabrics comprising:

(a) padding a cellulosic fabric with a solution comprising sufficient amounts of: N-methylol crosslinking agent, an acid catalyst, a halogen containing alcohol, and antimony oxide to produce smooth-dry flame retardant properties in the fabric;

(b) drying said cellulosic fabric for sufficient time and at sufficient temperature to drive off the moisture; and then,

(c) curing said cellulosic fabric for sufficient time and temperature to impart smooth-dry flame retardant properties to said fabric.

4,536,423

WALL ORNAMENT FOR SHOWER AND BATHTUB ENCLOSURES

E. Clayton Travis, 4235 Island View Dr., Linden, Mich. 48451

Filed Aug. 16, 1984, Ser. No. 641,272
Int. Cl.³ B44C *5/04*
U.S. Cl. 428—14 **2 Claims**

1. As an article of manufacture, a waterproof ornamental poster for attachment to a vertical wall of a tub or shower enclosure, comprising:

an enlarged photograph of a person or other image;

the contours of said image being die cut generally along its periphery, defining a contoured outer peripheral edge;

an envelope of thin transparent plastic waterproof material enclosing said die cut image, including a first layer overlying the image face and a second layer overlying the image obverse face, and said envelope having a contoured peripheral portion enclosing said die cut image peripheral edge in sealed watertight relation; and

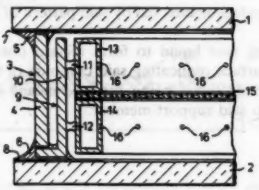
a plurality of spaced strips of pressure sensitive adhesive mounted on and overlying said second envelope layer in spaced relation generally along its vertical length for engagement with said vertical tub or shower enclosure wall, retaining said waterproof ornamental poster in snug supported relation along its length.

4,536,424

GLAZING UNITS

Michel Laurent, Nivelles, Belgium, assignor to Glaverbel, Brussels, Belgium

Filed Jan. 31, 1984, Ser. No. 575,534
Claims priority, application United Kingdom, Feb. 4, 1983, 8303069
Int. Cl.³ E06B 3/24
U.S. Cl. 428—34 13 Claims



1. A hollow glazing unit comprising vitreous sheets having metallized margins held in spaced relationship by marginal spacing means, wherein a plastic foil is held taut between and in spaced relationship to said vitreous sheets by foil holding means located between said vitreous sheets, said spacing means comprises one or more metal strips forming a spacing web which is located outwardly of the periphery of said foil, said metal strips are connected to the vitreous sheets at their margins by soldered joints and said foil holding means comprises one or more components distinct from the spacing web, whereby the spacing web is capable of being angularly deflected without moving said foil holding means.

4,536,425

METHOD FOR PREPARING POLAR THERMOPLASTIC RESIN COMPOSITIONS HAVING IMPROVED GAS BARRIER PROPERTIES

Ihab M. Hekal, Stamford, Conn., assignor to Continental Can Company, Stamford, Conn.

Filed Jun. 8, 1984, Ser. No. 618,699
Int. Cl.³ B65D 81/00; C08L 67/02
U.S. Cl. 428—35 27 Claims

1. A method of preparing a polar thermoplastic resin having increased resistance to gas permeability which comprises providing a blend of the resin and mica flakes having a plurality of platelets, the flakes having a particle size less than about 100 mesh before blending and then admixing the mica flakes and resin at a temperature at which the resin is molten, the admixing imparting a shear force which effects delamination of the mica platelets and a substantial increase in the aspect ratio whereby improved gas barrier and heat stability properties are achieved.

4,536,426

SELF ADHESIVE NAIL OVERLAY OR WRAP

Becky L. Massey, 25799 N. Player Dr., Valencia, Calif. 91355

Filed Nov. 9, 1983, Ser. No. 549,964
Int. Cl.³ A45D 31/00
U.S. Cl. 428—42 3 Claims

1. The process of strengthening and protecting human nails with a permeable nail overlay having one side coated with a pressure sensitive adhesive of non-permanent bonding material and secured to release backing paper-comprising the sequential steps of:

(a) shaping the nail overlay to a human nail to be strengthened;

(b) simultaneously cutting the nail overlay and release backing paper to the general outline of the human nail;

(c) separating the release backing paper from the nail overlay;

(d) adhering the nail overlay to the human nail with non-permanent bonding material; and,

(e) applying a coat of glue to the top of the nail overlay and permanently bonding the nail overlay to the human nail.

4,536,427

SCRIMLESS CONTOURABLE CORE FOR USE IN LAMINATED CONTOURED STRUCTURES

Henri-Armand Kohn, Northvale, N.J., assignor to Baltek Corp., Northvale, N.J.

Filed Mar. 26, 1984, Ser. No. 593,130
Int. Cl.³ B32B 3/10, 7/08, 31/00
U.S. Cl. 428—44 8 Claims

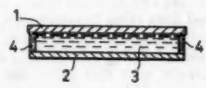
1. A scrimless contourable core for inclusion in laminated structures, said core comprising a planar array of four-sided identical rectangular modules formed of end-grain balsa wood, all of whose adjacent sides are held together by flexible joints of taffy-like adhesive that has a short elastic limit, such that when the outer face of the planar core is pressed against a contoured surface for lamination of the inner face thereto, the resultant stresses cause adjacent modules of the core to pull apart and to cause the joints therebetween to stretch beyond their elastic limit to an extent necessary to conform the pulled-apart modules to this surface without spring-back when the stresses are relieved.

4,536,428

MAGNETIC DISPLAY PANEL

Yasuzo Murata, and Hiroshi Sato, both of Kanagawa, Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,700
Claims priority, application Japan, Jun. 20, 1979, 54-77646
Int. Cl.³ B43L 1/12
U.S. Cl. 428—117 35 Claims



1. A magnetic display panel comprising:

a liquid containing panel having a front substrate formed of a material selected from the group consisting of transparent and translucent materials and a rear substrate disposed opposite to said substrate and bonded thereto by an adhesive comprising a polyester adhesive, a liquid sealing space being formed between said substrates; and

a dispersing liquid having a yield value of at least 5 dyne/cm² sealed in said space, said dispersing liquid comprising, a fine particulate thickener selected from the group consisting of an olefinic polymer, olefinic copolymer, metal soap, fatty acid amide, wax and dextrin fatty acid ester; fine magnetic particles, a colorant and a dispersion medium, an image being recordable on said panel by a movable marking device having an oriented magnetic field.

4,536,429

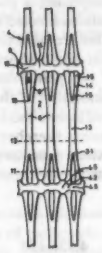
PLASTICS MATERIAL MESH STRUCTURE

Frank B. Mercer, Blackburn, England, assignor to P.L.G. Research Limited, Blackburn, England

Continuation of Ser. No. 568,932, Jan. 10, 1984, abandoned, which is a continuation of Ser. No. 429,609, Sep. 30, 1982, abandoned. This application Sep. 21, 1984, Ser. No. 652,885
Claims priority, application United Kingdom, Oct. 5, 1981, 8130021
Int. Cl.³ B32B 3/10
U.S. Cl. 428—136 17 Claims

1. An integral plastics material mesh structure which has been uniaxially stretched, and comprises a substantial number

of spaced parallel parts which run substantially right across the structure substantially at right angles to the direction of stretch, said parts comprising at least zones regularly spaced along their lengths which are unorientated or orientated only to a low degree, and said parts either being continuous or being discontinuous and interrupted by regularly-spaced mesh openings, each discontinuous length so formed being connected to the adjacent discontinuous length of the same said part by at least two highly orientated strands whose axes are inclined to each other but which extend generally in the direction of stretch, and each of which highly-orientated strands has one end connected to a respective said discontinuous length and the other end connected to the other highly orientated strand at a junction; said continuous parts being connected to adjacent



said continuous parts, or said junctions of said discontinuous parts being connected to said junctions of adjacent said discontinuous parts, by highly orientated interconnecting strands extending generally in the direction of stretch, said interconnecting strands comprising generally-parallel, spaced, side-by-side strands, an end of each of which side-by-side strands forks into only two further generally parallel said interconnecting strands, whereby there are two notional lines across said structure, said two notional lines lying between two adjacent said continuous parts or between said junctions of two adjacent said discontinuous parts, and extending substantially at right angles to the direction of stretch, such that a first said notional line crosses substantially more said interconnecting strands than the second said notional line.

4,536,430

PROCESS FOR THE PRODUCTION OF LEATHER BASE MATERIAL

Edmond D. Krecke, 72 Boulevard de la Pétrusse, LU-Luxemburg Stadt, Luxembourg

Filed May 26, 1982, Ser. No. 382,085
Int. Cl.³ C08J 9/00; C08L 89/06
U.S. Cl. 428—151 **37 Claims**

1. A process for the production of leather base material comprising:

(a) dividing leather waste into pieces;

(b) subjecting the pieces to mechanical working to cause the pieces to break up into fine material and individual fibers, said fibers being generally in the range from 2 to 14 mm in length;

(c) separating the fibers from the fine material; and

(d) incorporating said fibers into a leather base material.

4,536,431

METHOD OF TEXTURING A SURFACE AND ARTICLES TEXTURED BY THE METHOD

Robert L. Wyckoff, 136 Oran Ct., Napa, Calif. 94558

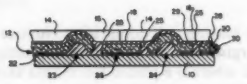
Filed Aug. 5, 1983, Ser. No. 520,586
Int. Cl.³ B32B 3/26
U.S. Cl. 428—162 **25 Claims**

1. Method of producing a textured finish on a given area of a smooth support member, comprising the steps of:

(a) conforming a porous sheet material (20) to said area of the support member, said porous sheet material having an exterior surface with contours according to a desired three-dimensional pattern;

(b) applying a coating of a hardenable liquid (22) having adhesive properties relative to said support member, said liquid being applied to said porous sheet material at a volume rate per unit of said area sufficient for substantial saturation of said porous sheet material and penetration therethrough to said support member for sealing the pores of said sheet material but insufficient to provide a smooth exterior surface unaffected by said pattern of the material; and

(c) hardening said liquid to form a hard coating on said exterior surface replicating said contours of the material, said hardened liquid being the sole means adhering the material to said support member.



24. An article textured by the method of claim 1, said article consisting of:

(a) a smooth surface to be textured,

(b) a single, thin layer of sheet material having a particular texture and including a plurality of pores, said sheet material overlying said surface with an interior side of said layer adjacent thereto and an exterior side spaced therefrom;

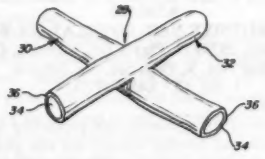
(c) a hard coating having a first portion in direct, adherent relation to said surface, a second portion adjacent said exterior side and enveloping said sheet material in fashion replicating said particular texture, and a third portion penetrating said pores and linking said first and second portions.

4,536,432

STABILIZED ABSORBENT STRUCTURE AND METHOD OF MAKING SAME

Dennis C. Holtman, Flemington, N.J., assignor to Personal Products Co., Milltown, N.J.

Filed Apr. 18, 1984, Ser. No. 601,755
Int. Cl.³ D21C 3/20; C07D 5/22
U.S. Cl. 428—171 **10 Claims**



1. The method of forming an absorbent batt comprising the steps of: providing an assemblage of non-delignified wood pulp fibers, applying a solvent to said assemblage of non-delignified wood pulp fibers to soften at least 10 percent of the lignin of said fibers; compressing said assemblage of non-delignified wood pulp fibers to cause softened portions of the lignin to form lignin-to-lignin interfiber bonds at fiber intersections; and

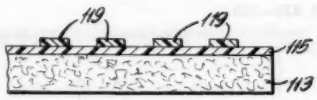
removing the solvent from said assemblage of non-delignified wood pulp fibers.

4,536,433

SLIP RESISTANT ABSORBENT PAD

Zsigmond L. Sagi, 25 Arden Rd., Denville, and Craig R. Hof, 112 Santa Fe Trail, Hopatcong, both of N.J. 07834

Filed Sep. 16, 1983, Ser. No. 532,796
Int. Cl.³ B32B 27/06, 3/10
U.S. Cl. 428—195 4 Claims



1. A slip resistant article comprising a layer of moisture-absorbent material, water-impervious layer overlying said moisture-absorbent layer and a layer of a wax having a needle penetration value of from about 5 to about 70 and a melting point of from about 150° F. to about 200° F. on said water-impervious layer.

4,536,434

HEAT TRANSFER LAMINATE

Frank A. Magnotta, Framingham, Mass., assignor to Dennison Manufacturing Co., Framingham, Mass.

Filed Oct. 20, 1983, Ser. No. 544,024
Int. Cl.³ B32B 7/06, 7/10; C09J 7/02
U.S. Cl. 428—200 20 Claims

1. In a heat transferable laminate of the type including a carrier support and a heat transferable substrate comprising a release layer in contact with the carrier support, and an ink design layer, said substrate being transferable from the carrier support to a receiving article upon application of heat to the carrier while said receiving article contacts the transferable substrate, an improved release layer, comprising:

a wax component; and

a binder resin comprising a thermoplastic acrylic-based terpolymer resin selected from the group consisting of a monoolefin/vinyl acetate/acrylic acid terpolymer and a monoolefin/allyl acetate/acrylic acid terpolymer, the improved release having a drop melting point between about 85° C. to 135° C., permitting transfer at between about 300° F. and 600° F. in less than 2 seconds and resolidifying after transfer to provide a transparent, matte, nonglossy, protective coating.

4,536,435

MULTILAYER SUBSTRATE INCLUDING LAYERS OF AN ALUMINA AND BOROSILICATE-LEAD-GLASS CERAMIC MATERIAL

Kazuaki Utsumi; Yuzo Shimada; Masanori Suzuki, and Hideo Takamizawa, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1982, Ser. No. 434,238
Claims priority, application Japan, Oct. 14, 1981, 56-164017
Int. Cl.³ B32B 3/00
U.S. Cl. 428—209 5 Claims

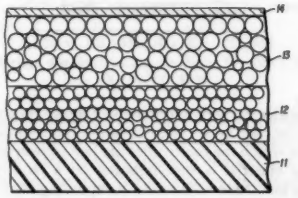
1. A multilayer substrate comprising a plurality of glass-ceramic insulator layers with interposed circuit patterns, wherein each glass-ceramic insulator layer has a composition consisting essentially of, when components of said composition are expressed as oxides, 40 through 60 percent by weight of aluminum oxide, 1 through 40 percent by weight of lead oxide, 1 through 30 percent by weight of boron oxide, 2 through 40 percent by weight of silicon dioxide, 0.01 through 25 percent by weight of at least one oxide selected from oxides of chemical elements of magnesium, calcium, strontium, barium and zinc, and 0.01 through 10 percent by weight of at least one oxide selected from oxides of chemical element of zirconium, titanium, germanium, and tin.

4,536,436

RADIOGRAPHIC IMAGE CONVERSION SCREENS

Hidehiko Maeoka, Takaido-Higashi; Etsuo Shimizu, Higashi-Nakano; Yujiro Suzuki, Odawara; Keiji Shimiya, Hiratsuka, and Norio Miura, Isehara, all of Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Continuation of Ser. No. 376,020, May 7, 1982, abandoned. This application May 21, 1984, Ser. No. 612,317
Claims priority, application Japan, Mar. 15, 1982, 57-39310
Int. Cl.³ B32B 7/02
U.S. Cl. 428—212 8 Claims



1. A radiographic image conversion screen, having a speed and/or an image quality at least equal to that of a conventional radiographic image conversion screen which has only a green emitting rare earth phosphor layer, consisting essentially of: (a) a support; (b) a first fluorescent layer formed on said support and consisting essentially of a blue emitting phosphor which is selected from the group consisting of:

(I) a yttrium or yttrium-gadolinium oxysulfide phosphor represented by the formula:

$$(Y_{1-c-d-e}, Gd_c, Tb_d, Tm_e)_2O_2S$$

where c, d and e are numbers within the ranges of $0 \leqq c \leqq 0.60$, $0.0005 \leqq d \leqq 0.02$ and $0 \leqq e \leqq 0.01$, respectively; and

(II) a rare earth oxyhalide phosphor represented by the formula:

$$(Ln'_{1-x-y-z}, Tb_x, Tm_y, Yb_z)OX$$

where Ln' is at least one element selected from the group consisting of lanthanum and gadolinium, X is at least one element selected from the group consisting of chlorine and bromine, and x, y and z are numbers within the ranges of $0 \leqq x \leqq 0.01$, $0 \leqq y \leqq 0.01$, $0 \leqq z \leqq 0.005$ and $0 \leqq x+y$; and (c) a second fluorescent layer formed on said first fluorescent layer and consisting essentially of a green emitting rare earth oxysulfide phosphor represented by the formula:

$$(Ln_{1-a-b}, Tb_a, Tm_b)_2O_2S$$

where Ln is at least one element selected from the group consisting of lanthanum, gadolinium and lutetium, and a and b are numbers within the ranges of $0.0005 \leqq a \leqq 0.09$ and $0 \leqq b \leqq 0.01$, respectively, or the formula:

$(Y_{1-i-a-b}\ Ln_i\ Tb_a\ Tm_b)_2O_2S$

where Ln is at least one element selected from the group consisting of lanthanum, gadolinium and lutetium, and i, a and b are numbers within the ranges of $0.65 \leqq i \leqq 0.95$, $0.0005 \leqq a \leqq 0.09$ and $0 \leqq b \leqq 0.01$, respectively.

4,536,437

ELECTROTHERMIC NON-IMPACT RECORDING MATERIAL

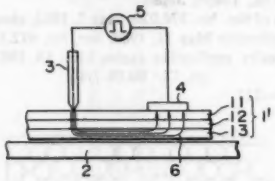
Toshiyuki Kawanishi, and Yukio Tabata, both of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,234

Claims priority, application Japan, Dec. 28, 1982, 57-229215; Dec. 28, 1982, 57-229216

Int. Cl.³ B41M *5/26*

U.S. Cl. 428—212 **21 Claims**



1. In an electrothermic non-impact image transfer recording material for use in an electrothermic non-impact recording method in which the electrothermic non-impact image transfer recording material is superimposed on a recording sheet, a recording electrode with multiple recording styli and a return electrode are placed in contact with the recording material, and image-delineating signal voltage is applied across the recording material through the recording electrode and the return electrode, so that an ink is transferred imagewise from the recording material to the recording sheet, the improvement wherein said electrothermic non-impact image transfer recording material comprises at least a base layer and an ink layer, the base layer comprises as the main components a polyamide resin binder and carbon black, said polyamide resin binder is selected from the group consisting of aromatic polyamides and nylons, and said ink layer comprises a coloring component and a resin.

4,536,438

FIBRE REINFORCED COMPOSITES

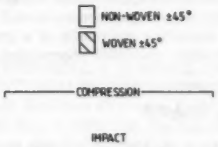
Sarah M. Bishop, and Paul T. Curtis, both of Farnborough, England, assignors to The Secretary of State for Defence in Her Brittanic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 9, 1984, Ser. No. 588,107

Claims priority, application United Kingdom, Mar. 10, 1983, 8306653

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—246 **7 Claims**



1. A fibre reinforced composite comprising one or more layers of unidirectional non-woven fibres alternated with one or more layers of woven fibres having a pattern of weave which is a five or more shaft satin weave, all said fibres embedded in a plastic matrix, the outermost layers at the surface of the composite being of the woven satin fibres.

4,536,439

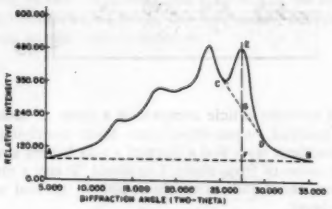
LIGHT WEIGHT FILTER FELT

Herman H. Forsten, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 7, 1985, Ser. No. 689,164

Int. Cl.³ D04H *1/08*

U.S. Cl. 428—280 **3 Claims**



1. A fabric consisting essentially of entangled staple fibers of poly(m-phenylene isophthalamide), said staple fibers having a length of 1 to 5 cm, the fibers having a crystallinity index of at least about 0.50, the fabric having a basis weight of between 200 and 350 g/m^2, an air permeability of 12 to 30 $m^3/min/m^2$, a cross-machine-direction modulus of greater than 40 Kg/cm^2 and an abrasion resistance such that it will go through at least 500 cycles before failure in the Taber abrasion test.

4,536,440

MOLDED FIBROUS FILTRATION PRODUCTS

Harvey J. Berg, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 27, 1984, Ser. No. 593,937

Int. Cl.³ B32B *5/06*

U.S. Cl. 428—284 **15 Claims**

1. A molded filtration product comprising at least two fibrous layers which have been subjected to heat and molding pressure while assembled in face-to-face contact with one another, one or more of the layers being a shaping layer that (a) in total have a basis weight no greater than 150 pounds per ream, (b) in total contribute no more than about 20 percent of the pressure drop through the finished filtration product, and (c) at least one of which comprises fibers bound together at points of fiber intersection by coalescence of binder material on the fibers; and another of the layers being a fibrous filtration layer which removes particulates from a gaseous stream passed through the filtration product in a higher percentage than the shaping layer removes them; any shaping layer upstream of the filtration layer having a basis weight of no greater than about 50 pounds per ream; the filtration layer being attached to the shaping layer or layers by at least fiber entanglement, and being conformed into contact with the shaping layer or layers over the full interface between the layers.

4,536,441

ADHESIVE TAPE

Gert Schmeer, Bergen; Eberhard Engelmann, and Karl Schäfer, both of Hamburg, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 618,990
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3323018
Int. Cl.³ B32B 7/12; C09J 7/02
U.S. Cl. 428—317.3 12 Claims

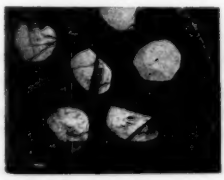
1. Adhesive tape having a base material which is stretched more highly at right angles to the web direction than in the web direction, contains polypropylene as the main component, and is provided with at least one pressure-sensitive or heat-sealable adhesive layer, characterised in that the base material is foamed and that the stretch ratio in the web direction is 1:1 to 1:4 and at right angles to the web direction is 1:3 to 1:8, the stretch ratio at right angles to the web direction being greater than the stretch ratio in the web direction.

4,536,442

PROCESS FOR MAKING DIAMOND AND CUBIC BORON NITRIDE COMPACTS

Harold P. Bovenkerk; Paul D. Gigl, both of Worthington, and Francis R. Corrigan, Westerville, all of Ohio, assignors to General Electric Company, Worthington, Ohio

Continuation of Ser. No. 69,204, Aug. 23, 1979, abandoned. This application May 2, 1983, Ser. No. 488,003
Int. Cl.³ B32B 5/16
U.S. Cl. 428—323 2 Claims



1. An improved optical window for adverse environments wherein the improvement comprises a window consisting essentially of a single layer of large diamond crystals from 425 to 1700 microns in largest dimension bonded in a polycrystalline matrix made of the same material as the large crystals, said window having a light transmittance of at least 20% for infrared light at wave lengths of up to 50 microns.

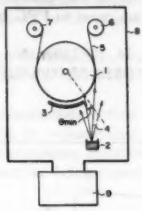
4,536,443

MAGNETIC RECORDING MEDIUM

Makoto Nagao, and Akira Nahara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 26, 1983, Ser. No. 536,049
Claims priority, application Japan, Sep. 29, 1982, 57-170649
Int. Cl.³ G11B 5/64
U.S. Cl. 428—336 4 Claims

1. A magnetic recording medium comprising a non-magnetic substrate and at least one layer of obliquely deposited magnetic crystals having a curved columnar structure which contains, as a main constituent, Co or a Co—Ni based alloy containing Cr in an amount within the range of 2 to 8 atom % and has a



density of 5.0 g/cm³ or more, said layer being formed on said non-magnetic substrate.

4,536,444

MAGNETIC RECORDING MEDIUM

Kenji Sumiya, Suita; Fumio Togawa, Ohtsu, and Osamu Saito, Takatsuki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Nov. 16, 1984, Ser. No. 671,960
Claims priority, application Japan, Nov. 17, 1983, 58-217274
Int. Cl.³ G11B 5/72
U.S. Cl. 428—340 11 Claims

1. A magnetic recording medium comprising a substrate, a magnetic layer formed on the substrate and comprising a metallic magnetic material as a recording element and a protective layer formed on the magnetic layer and comprising a perfluroalkyl polyether derivative having a phosphate terminal group.

4,536,445

ELASTOMER BASED ADHESIVE COMPOSITIONS

Lester T. Toy, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 586,638, Mar. 6, 1984, Pat. No. 4,497,926. This application Nov. 16, 1984, Ser. No. 672,446
Int. Cl.³ B32B 1/08, 25/04, 31/26
U.S. Cl. 428—349 17 Claims

1. A dimensionally recoverable article comprising:

(a) an expanded elastomeric sheet maintained in the expanded state;

(b) a restraining means for maintaining said elastomeric sheet in the expanded state; and

(c) a layer of adhesive composition on the surface of said elastomeric sheet which is in the direction of dimensional recovery of the sheet, said adhesive composition consisting essentially of:

(i) 100 parts of an elastomer selected from the group consisting of polar elastomers and unsaturated elastomers which have at least 5 mole percent unsaturation, said elastomer being a non-crystalline elastomer or an elastomer which has a slow rate of crystallization such that after a time period of at least 100 hours has elapsed following subjecting the elastomer to a temperature of 70° C. for 30 minutes, the elastomer has a room temperature Shore A hardness of less than 60;

(ii) 5 to 200 parts of a tackifier;

(iii) 0.5–20 parts of an oxide of a metal of Group Ia, IIa, IIb, IVa, or VIIb of the Periodic table; and

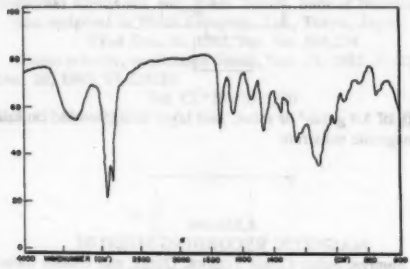
(iv) 0–100 parts of a plasticizer; said adhesive composition exhibiting a flow of at least 30% at 97° C. under a compressive load of 50 grams.

4,536,446

TREATED GLASS FIBERS AND NONWOVEN SHEET-LIKE MAT AND METHOD

Edward C. Hsu, Pittsburgh, and Chester S. Temple, McKees Rocks, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 24, 1982, Ser. No. 422,617
Int. Cl.³ B32B *27/00*; D02G *3/00*
U.S. Cl. 428—392 **20 Claims**



1. Chopped glass fibers treated during their formation with a chemical treating composition so that the glass fibers have good water solubility and result in improved strength properties of products incorporating the chopped glass fibers, wherein the composition consists essentially of:

a. nonionic surfactant,

b. cationic quaternary ammonium salt surfactant, wherein the ratio of the nonionic to cationic surfactants is about 1 to about 99 to about 99 to 1, and

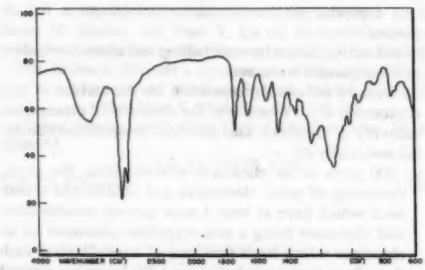
c. a major amount of water to give an effective total solids content for the composition for treating the glass fibers during their formation.

4,536,447

TREATED GLASS FIBERS AND AQUEOUS DISPERSION AND NONWOVEN MAT OF GLASS FIBERS

Ed C. Hsu, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 24, 1982, Ser. No. 422,771
Int. Cl.³ B32B *27/00*; D02G *3/00*
U.S. Cl. 428—392 **18 Claims**



1. Chopped glass fibers having an aqueous chemical treating composition consisting essentially of:

a nonionic surfactant,

b. cationic quaternary ammonium salt surfactant, where the ratio of the nonionic to cationic surfactants is about 1 to about 99 to about 99 to 1,

c. polar functional coupling agent selected from the group consisting of organo metallic and organo-silane coupling agents having polar organic functionalities, and

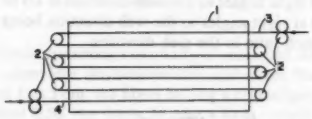
d. water in an amount to give a total solids content that is effective for applying the composition to glass fibers.

4,536,448

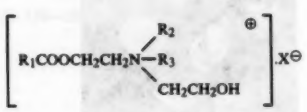
PREOXIDIZED FIBER AND PROCESS FOR PRODUCING THE SAME

Hiroyasu Ogawa, No. 16-10, Hatsunedai, Mishima-shi; Tetsuro Shigei, No. 234 Minami Isshiki, Nagaizumi-cho, Sunto-gun, Shizuoka; Hayashi Takahashi, No. 66-5, Minami Isshiki, Nagaizumi-cho, Sunto-gun, Shizuoka; Tetuya Okabe, No. 3-2, Mizukubo, Susono-shi, Shizuoka, and Fumio Miyatake, No. 234, Minami Isshiki, Nagaizumi-cuo, Sunto-gun, Shizuoka, all of Japan

Continuation-in-part of Ser. No. 333,959, Dec. 23, 1981, abandoned. This application Sep. 8, 1983, Ser. No. 530,326
Claims priority, application Japan, Dec. 27, 1980, 55-185528
Int. Cl.³ C01B *31/07*; D02G *3/00*
U.S. Cl. 428—394 **20 Claims**



1. A process for producing a preoxidized fiber, comprising contacting an acrylic fiber with a solution or dispersion of an ammonium salt of a fatty ester at a temperature of from 20° to 70° C., which solution or dispersion is at a pH of 4 or less, which solution or dispersion contains said ammonium salt of a fatty ester in an amount sufficient to provide from 0.01 to 0.5%, based on the weight of the fiber, of said ammonium salt of a fatty ester on said fiber, said ammonium salt of a fatty ester being represented by formula [A]



wherein R_1 is an aliphatic hydrocarbon group having from 11 to 17 carbon atoms; R_2 and R_3 can each be hydrogen, a lower alkyl group, a hydroxyethyl group, or an hydroxyisopropyl group; and $X^{\ominus}$ is an anion, drying said fiber, and thereafter preoxidizing said fiber.

4,536,449

REACTION BONDED SILICON CARBIDE ARTEFACTS

Peter Kennedy, Preston, and Kenneth Parkinson, Liverpool, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

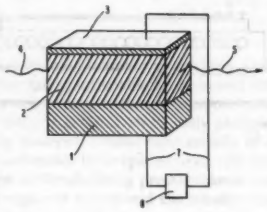
Filed Aug. 27, 1984, Ser. No. 644,359
Claims priority, application United Kingdom, Sep. 7, 1983, 8323994
Int. Cl.³ B32B *9/00*; C04B *33/34*
U.S. Cl. 428—408 **9 Claims**

1. A silicon carbide-silicon matrix composite incorporating unreacted coarse carbon particles dispersed throughout the composite.

4,536,450
NONLINEAR OPTICAL MATERIALS AND PROCESSES EMPLOYING DIACETYLENES

Anthony F. Garito, Radnor, Pa., assignor to University Patents, Inc., Norwalk, Conn.

Division of Ser. No. 129,560, Mar. 12, 1980, Pat. No. 4,431,263, which is a continuation-in-part of Ser. No. 52,007, Jun. 25, 1979, abandoned. This application Nov. 21, 1983, Ser. No. 554,196
Int. Cl.[3] B32B *9/04*
U.S. Cl. 428—411.1 7 Claims

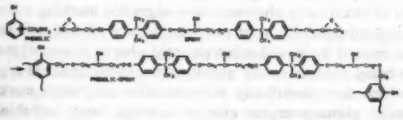


1. An article comprising:
a substrate; and
at least one layer on said substrate of at least one substantially polymerized diacetylene, said diacetylene being crystallizable into a crystal having a non-centrosymmetric unit cell, said article exhibiting sensible non-linear optical, piezoelectric or pyroelectric effects.

4,536,451
RIGID MAGNETIC RECORDING MEDIA COATING COMPOSITION

John C. S. Shen, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1983, Ser. No. 566,070
Int. Cl.[3] G11B *5/70*
U.S. Cl. 428—418 7 Claims



1. A rigid magnetic recording medium having finely divided magnetic particles dispersed in a mixture of phenolic-styrene allylalcohol/phenolic-epoxy thermosetting resin binder composition applied as a thin film, having a thickness of less than 40 microinches, closely adhered to a rigid non-magnetic substrate wherein the coating composition includes 50 to 80 percent by weight of magnetic particles, 20 to 50 percent by weight of binder and comprises:
10 to 45 parts by weight of a hard thermoset phenolic-styrene allkyalcohol resin,
55 to 90 parts by weight of a tough thermoset phenolic-epoxy resin,
and additives, including a blocked acid catalyst, not exceeding 10 parts by weight.

4,536,452
SPONTANEOUSLY-FORMED MACHINABLE GLASS-CERAMICS

John L. Stempin, Beaver Dams, and Dale R. Wexell, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 24, 1983, Ser. No. 544,841
Int. Cl.[3] B32B *15/04*
U.S. Cl. 428—433 2 Claims

1. A machinable glass-ceramic article having a crystal content greater than 50% by volume and being essentially free from any mica phase consisting essentially, in weight percent on the oxide basis (fluorine being reported as fluoride), of:

SiO_2: 24–48
Al_2O_3: 9–20
MgO: 12–28
SrO: 8.7–11
BaO: 1.9–14
CuO: 0–5
Ag_2O: 0–3.5
NiO: 0–1.5
Cr_2O_3: 0.5–6.5
F: 2–9.

4,536,453
COATED POLYOLEFINIC FILMS HAVING LOW ADHESION TO THE WELDING BARS

Luigi Mauri, and Rino Cardaio, both of Terni, Italy, assignors to Moplefan S.p.A., Milan, Italy

Filed Apr. 25, 1983, Ser. No. 488,591
Claims priority, application Italy, Apr. 26, 1982, 20935 A/82
Int. Cl.[3] B32B *5/16, 27/08*
U.S. Cl. 428—484 9 Claims

1. A polyolefinic film having low adhesion to welding bars, coated on one or both sides with a coating agent consisting of a mixture of:
from 50% to 90% by weight of a copolymer consisting of from 95% to 85% by weight of a vinyl ester and of from 5% to 15% by weight of an unsaturated acid;
from 49.5% to 9.5% by weight of a terpolymer consisting of from 25% to 40% by weight of at least one alkyl-acrylate, from 70% to 40% be weight of at least one alkyl-methacrylate and from 5% to 20% by weight of an unsaturated acid; and
from 0.5% to 1.5% by weight of a C_1–C_4 polyalkylene-imine having a cross-linking action.

4,536,454
FLEXIBLE COATING COMPOSITION AND METHOD OF APPLYING SAME

Robert J. Hassl, St. Paul, Minn., assignor to PDI, Inc., St. Paul, Minn.

Filed Aug. 26, 1983, Ser. No. 526,646
Int. Cl.[3] B32B *27/08;* B05D *3/02*
U.S. Cl. 428—516 6 Claims

3. A substrate including a composite having cohesive and adhesive protective films thereon, and wherein the protective films comprise:

Component	Weight Percent
(a) a primer coating having the following formulation:	
Thermoplastic resin consisting of methylmethacrylate copolymer	86.7
Silicon dioxide filler	11.7
A thermoplastic rubber consisting of styrene/ethylene/butylene/styrene block copolymer	1.6
(b) a top coating having the following formulation:	
A thermoplastic rubber consisting essentially of a styrene/ethylene/butylene/styrene block copolymer	56.6

-continued

Component	Weight Percent
Silicon dioxide filler	6.1
Calcium Carbonate	15.5

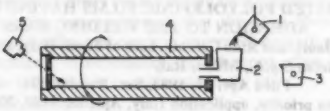
and wherein the composite coatings are permitted to air-dry until the solvent has been substantially removed.

4,536,455

CENTRIFUGALLY CAST DOUBLE-LAYER TUBE WITH RESISTANCE TO CARBON DEPOSITION

Keikichi Maeda; Takahiro Iijima, both of Yokohama, and Eiichi Sato, Atsugi, all of Japan, assignors to JGC Corporation, Tokyo and Taihei Kinzoku Kogyo Co., Ltd., Yamato, both of, Japan

Filed Jul. 26, 1983, Ser. No. 517,292
Claims priority, application Japan, Jul. 26, 1982, 57-129980
Int. Cl.³ B32B *15/00*
U.S. Cl. 428—629 **7 Claims**



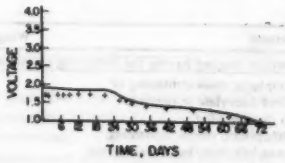
1. A centrifugally cast double-layer tube which exhibits improved resistance to carbon deposition on the inner surface thereof caused by treating a fluid containing hydrocarbons, derivatives of hydrocarbons or carbon monoxide at an elevated temperature within said tube, said tube comprising an outer annular layer of a first, heat-resistant metal and an inner annular layer bonded directly to said outer layer, said inner layer being made of a second metal containing from 1 to 10 wt. % of aluminum and the balance is selected from the group consisting of austenitic steel, ferritic steel, austenite-ferrite duplex-phase steel, low-alloy steel, Ni alloy, Ni-Cr alloy, Co alloy and Co-Cr alloy.

4,536,456

TELLURIUM-CONTAINING CATHODES FOR NONAQUEOUS CELLS

William P. Evans, Rocky River, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 29, 1983, Ser. No. 509,023
Int. Cl.³ H01M *4/02, 10/40*
U.S. Cl. 429—194 **8 Claims**



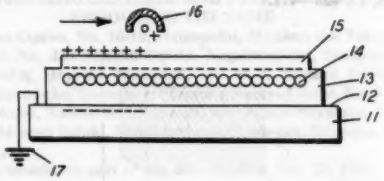
1. A solid cathode material for nonaqueous cells comprising a fused material selected from the group consisting of Te_2-MoO_7, TeO_2-xBi_2O_3 wherein x is from greater than 0 to about 8, Sb_2TeO_5 and Sb_2TeO_7.

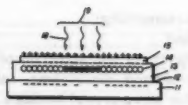
4,536,457

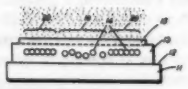
MIGRATION IMAGING PROCESS

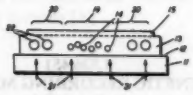
Man C. Tam, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1984, Ser. No. 568,001
Int. Cl.³ G03G *13/22*
U.S. Cl. 430—41 **15 Claims**







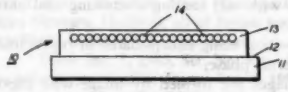


1. An imaging method comprising providing a migration imaging member comprising a substrate and an electrically insulating softenable layer on said substrate, said softenable layer comprising a charge transport molecule and a fracturable layer of electrically photosensitive migration marking material located substantially at or near the surface of said softenable layer spaced from said substrate, said charge transport molecule being predominantly nonabsorbing in the spectral region at which said electrically photosensitive migration marking material photogenerates charge carriers, being capable of increasing charge injection from said electrically photosensitive migration marking material to said softenable layer and being dissolved or molecularly dispersed in said softenable layer, electrostatically charging said member, exposing said member to activating radiation in an imagewise pattern whereby said electrically photosensitive migration marking material stuck by said activating radiation photogenerates charge carriers, decreasing the resistance to migration of migration marking marking material in said softenable layer sufficiently by exposure to solvent vapor to allow slight migration in depth of migration marking material towards said substrate in image configuration, and further decreasing the resistance to migration of marking material in said softenable layer sufficiently by heating to allow nonmigrated marking material to agglomerate.

4,536,458
MIGRATION IMAGING SYSTEM

Dominic S. Ng, Toronto, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1984, Ser. No. 567,838
Int. Cl.[3] G03G 5/04, 13/22
U.S. Cl. 430—41 14 Claims

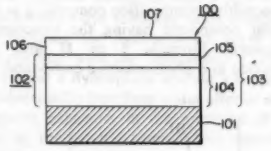


1. A migration imaging member comprising a substrate and an electrically insulating softenable layer on said substrate, said softenable layer comprising a charge transport molecule and a fracturable particulate layer of electrically photosensitive migration marking material located substantially at or near the surface of said softenable layer spaced from said substrate, said charge transport molecule being predominantly nonabsorbing in the spectral region at which said electrically photosensitive migration marking material photogenerates charge carriers, being capable of increasing charge injection from said electrically photosensitive migration marking material to said softenable layer and being dissolved or molecularly dispersed in said softenable layer.

4,536,459
PHOTOCONDUCTIVE MEMBER HAVING MULTIPLE AMORPHOUS LAYERS

Teruo Misumi, Kawasaki; Kyosuke Ogawa, Tokyo; Junichiro Kanbe, Yokohama; Keishi Saitoh, Tokyo; Yoichi Osato, Yokohama, and Shigeru Shirai, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1983, Ser. No. 474,311
Claims priority, application Japan, Mar. 12, 1982, 57-39837; Mar. 12, 1982, 57-39838; Mar. 12, 1982, 57-39839
Int. Cl.[3] G03G 5/082, 5/14
U.S. Cl. 430—57 21 Claims



1. A photoconductive member which comprises a support for a photoconductive member, a first amorphous layer exhibiting photoconductivity comprising an amorphous material containing silicon atoms as a matrix, said first amorphous layer having a first layer region containing oxygen atoms in a distribution which is continuous and nonuniform in the direction of layer thickness and a second layer region containing atoms belonging to the group III of the periodic table as constituent atoms in a distribution which is continuous and nonuniform in the direction of layer thickness, and a second amorphous layer comprising an amorphous material represented by any of the following formulae:

$$Si_aC_{1-a}(0.4<a<1) \quad (1)$$

$$(Si_bC_{1-b})_cH_{1-c}(0.5<b<1,\ 0.6\leqq c<1) \quad (2)$$

$$(Si_dC_{1-d})_eX_{1-e}(0.47<d<1,\ 0.8\leqq e<1) \quad (3)$$

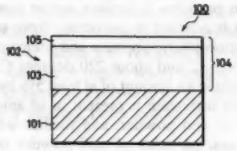
$$(Si_fC_{1-f})_g(H+X)_{1-g}(0.47<f<1,\ 0.8\leqq g<1) \quad (4)$$

wherein X represents a halogen atom.

4,536,460
PHOTOCONDUCTIVE MEMBER

Junichiro Kanbe, Yokohama; Shigeru Shirai, Yamato; Teruo Misumi, Kawasaki; Keishi Saitoh, Tokyo, and Yoichi Osato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,282
Claims priority, application Japan, Nov. 9, 1981, 56-179434; Nov. 13, 1981, 56-182655; Nov. 13, 1981, 56-182656
Int. Cl.[3] G03G 5/082
U.S. Cl. 430—57 41 Claims

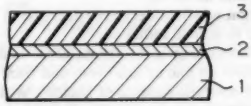


1. A photoconductive member comprising a support for a photoconductive member and an amorphous layer having photoconductivity constituted of an amorphous material comprising silicon atoms as a matrix, characterized in that said amorphous layer has a first layer region containing at least one kind of atoms selected from the group consisting of oxygen atoms, nitrogen atoms and carbon atoms as constituent atoms and a second layer region containing atoms of an element belonging to the group III of the periodic table as constituent atoms, said first layer region existing internally within said amorphous layer below the surface of said amorphous layer wherein the amorphous layer contains at least one of hydrogen atoms and halogen atoms as constituent atoms.

4,536,461
LAMINATED PHOTOSENSITIVE MATERIAL AND PROCESS FOR PRODUCTION THEREOF

Kaname Nakatani, Kawasaki; Junichi Hanna, Yokohama, and Hiroshi Kokado, Tokyo, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 15, 1984, Ser. No. 620,967
Claims priority, application Japan, Jun. 15, 1983, 58-105938
Int. Cl.[3] G03G 5/06, 5/14
U.S. Cl. 430—58 2 Claims



1. A laminated photosensitive material for the electrophotography, which comprises an electroconductive substrate, a charge-generating layer composed of a vacuum deposition film of metal-free phthalocyanine formed on the substrate and a charge-transporting layer formed on the charge-generating layer, wherein the metal-free phthalocyanine film is a metal-free phthalocyanine particle layer composed mainly of α-type fine crystals having a crystal particle size of 100 to 2000 Å and the vacuum deposition film has a thickness of 500 to 3000 Å and a dark electroconductivity lower than 10^{-10} $(\Omega\text{-cm})^{-1}$.

4,536,462
ENCAPSULATED PARTICULATE MAGNETIC DEVELOPMENT POWDERS CONTAINING A SUBLIMABLE DYESTUFF

Wolfgang Mehl, Geneva, Switzerland, assignor to International Toner Specialties, Ogden, Utah

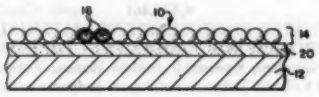
Filed Nov. 22, 1983, Ser. No. 554,273
Int. Cl.³ G03G 9/08
U.S. Cl. 430—106 **10 Claims**

1. Dry and free flowing electro-photographic development or toner powder of essentially spherical particles which have a diameter between about 5μ and about 50μ, said particles comprising an organic binder, ferromagnetic material, highly conducting carbon particles, a surface active compound, and a dyestuff which is adapted to evaporate from said particles in one minute at atmospheric pressure and a temperature between about 140 degrees C. and about 220 degrees C., wherein said dyestuff is present in an amount of at least 5% by weight of said powder and said surfactant is present in an amount of at least 4% by weight of said powder, and further wherein substantially each of said particles of said powder consists of two different solid phases in which the inner nucleus phase is surrounded by an outside shell phase, said inner nucleus phase comprising a first organic binder which is essentially void of ferromagnetic material, with 10% to 75% by weight of said inner nucleus phase consisting of said dyestuff and 4% to 20% by weight of said inner nucleus phase consisting of said surfactant, said outer shell phase, which is essentially void of dyestuff, comprising a second organic binder, with 30% to 80% by weight of said outer shell phase consisting of small particles of said ferromagnetic material and 2% to 20% by weight of said outer shell phase consisting of small particles of said highly conducting carbon.

4,536,463
IMAGING SYSTEM

Frederick W. Sanders, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 320,643, Nov. 12, 1981, Pat. No. 4,440,846. This application Dec. 16, 1983, Ser. No. 562,308
Int. Cl.³ G03C 1/72, 5/54, 5/16
U.S. Cl. 430—138 **22 Claims**



1. A photosensitive imaging system in which images are formed by image-wise reaction of one or more chromogenic materials and a developer, said system comprising:
- a substrate having front and back surfaces,
- a chromogenic material,
- a composition which undergoes a decrease in viscosity upon exposure to actinic radiation,
- a coating containing said chromogenic material and said composition on one of said front and back surfaces, and
- a developer material capable of reacting with said chromogenic material to form a visible image,
- said composition being encapsulated in rupturable capsules as an internal phase,
- wherein images are formed by image-wise exposing said coating to actinic radiation and rupturing said capsules in the exposed areas such that said internal phase is released from capsules in the exposed areas and said chromogenic material and said developer react pattern-wise to form an image.

10. A self-contained imaging sheet in which images are formed by image-wise reaction of one or more chromogenic materials and a developer material, said sheet comprising:
- a substrate having front and back surfaces,
- a chromogenic material,
- a composition which undergoes a decrease in viscosity upon exposure to actinic radiation,
- a coating containing said chromogenic material and said composition on one of said front and back surfaces, and
- a developer material capable of reacting with said chromogenic material to form a visible image co-deposited on said substrate with said coating containing said chromogenic material,
- said composition being encapsulated in rupturable capsules as an internal phase,
- wherein images are formed by image-wise exposing said coated substrate to actinic radiation and rupturing said capsules in the exposed areas such that said internal phase is released from said capsules in the exposed areas and said chromogenic material pattern-wise reacts with said developer material to form an image.

19. An imaging process which comprises:
- image-wise exposing to actinic radiation an imaging sheet comprising a substrate and a coating comprising a substantially colorless chromogenic material and rupturable capsules containing a photosensitive composition which undergoes a decrease in viscosity upon exposure to actinic radiation, and
- rupturing said capsules in the exposed areas in the presence of a developer material such that there is a patterned reaction between said chromogenic material and said developer material which produces a negative image corresponding to said exposure.

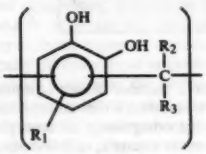
4,536,464
PHOTOSENSITIVE COMPOSITION WITH O-QUINONEDIAZIDE COMPOUND AND CONDENSATE OF DIHYDRIC PHENOL AND ALDEHYDE OR KETONE

Akira Nagashima; Akira Hasegawa, both of Shizuoka; Toshiaki Aoai, and Teruo Nagano, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Company Limited, Igara, Japan

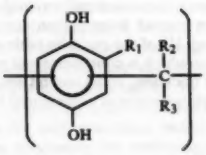
Filed Nov. 10, 1983, Ser. No. 550,420
Claims priority, application Japan, Nov. 10, 1982, 57-196108
Int. Cl.³ G03C 1/60, 1/54; G03F 7/08
U.S. Cl. 430—192 **7 Claims**

1. A photosensitive composition comprising in admixture, a high molecular compound having the structure shown by following general Formula I or II and an o-naphthoquinonediazide as a photosensitive compound;

I



II



wherein R_1 represents an ethyl group, a n-propyl group, a n-butyl group, a t-butyl group or a n-pentyl group and R_2 and R_3 each represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, wherein the proportion of the high molecular compound in the photosensitive composition is 2 to 90% by weight and wherein the o-naphthoquinonediazide com-

pound is present in the composition in an amount in the range of 10% to 50% by weight.

4,536,465

POSITIVE-WORKING PHOTOSENSITIVE COMPOSITION WITH O-QUINONE DIAZIDE AND ADMIXTURE OF RESINS

Masafumi Uehara, Koganei; Atsuo Yamazaki, Hinode, and Kazuhiro Shimura, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Jan. 7, 1983, Ser. No. 456,442
Claims priority, application Japan, Jan. 8, 1982, 57-1958
Int. Cl.³ G03C 1/60
U.S. Cl. 430—192 11 Claims

1. A positive-working photosensitive composition comprising in admixture (a) 10 to 50% by weight of an o-quinonediazide compound; (b) 1 to 80% by weight of a condensed resin containing a condensation unit composed of an aromatic compound having a carboxyl group and a phenolic hydroxyl group, and an aldehyde or ketone; and (c) 45 to 80% by weight of a novolak resin.

9. A photosensitive lithographic printing plate material including a support having thereon a positive-working photosensitive composition comprising in admixture (a) 10 to 50% by weight of an o-quinone diazide compound (b) 1 to 80% by weight of a condensed resin containing a condensation unit composed of an aromatic compound having a carboxyl group and a phenolic hydroxyl group, and an aldehyde or ketone and (c) 45 to 80% by weight of a novolak resin.

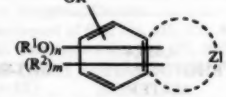
4,536,466

HEAT DEVELOPABLE ELEMENT WITH STABILIZER

Yukihiko Sakaguchi; Toshiaki Aono, and Shinsaku Fujita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1984, Ser. No. 594,511
Claims priority, application Japan, Mar. 30, 1983, 58-54166
Int. Cl.³ G03C 1/40, 5/54, 1/34
U.S. Cl. 430—203 25 Claims

1. A method of forming an image comprising heating a light-sensitive material having at least a light-sensitive silver halide, a binder and a dye releasing redox compound which is capable of reducing the light-sensitive silver halide and is capable of reacting with the light-sensitive silver halide by heating to release a hydrophilic dye on a support, under the condition substantially free from water after or simultaneously with imagewise exposure, in the presence of a compound represented by the general formula (A) described below to form imagewise a mobile dye



(A)

wherein R represents an alkyl group, a cycloalkyl group, an aryl group or an aralkyl group; R^1 represents an alkyl group, a cycloalkyl group, an aryl group or an aralkyl group; R^2 represents an alkyl group, an aryl group, an aralkyl group, a halogen atom or a group of R^1NH; Z represents an atomic group necessary to form a carbon ring condensed to the benzene ring; n represents 0, 1 or 2; m represents 0 or an integer from 1 to 7 and m+n is not more than 7; l represents 0 or 1; and each of R^1 and R^2 may be the same or different when m or n represents 2 or more, respectively.

14. A method of forming an image as claimed in claim 1, wherein the compound represented by the general formula (A) is present in a dye fixing material.

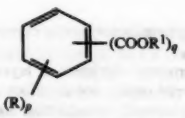
4,536,467

HEAT DEVELOPMENT OF SILVER HALIDE ELEMENT WITH REDOX DYE RELEASER AND STABILIZER

Yukihiko Sakaguchi; Toshiaki Aono, and Shinsaku Fujita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1984, Ser. No. 594,632
Claims priority, application Japan, Mar. 30, 1983, 58-54164
Int. Cl.³ G03C 5/54, 1/40, 1/34
U.S. Cl. 430—203 36 Claims

30. A process for forming an image comprising heating a light-sensitive material in a substantially water-free condition to form a mobile dye in an image pattern, said material having a support bearing thereon light-sensitive silver halide, a binder and a dye-releasing redox compound capable of imagewise reducing the silver halide and releasing a hydrophilic dye on reaction with said silver halide when heated, after or simultaneously with imagewise exposure, in the presence of a compound having a melting point below 60° C. represented by formula (A)



(A)

wherein p is an integer of 1 to 5 and q is an integer of 1 to 4, provided that p+q is 6 or less; R represents a hydrogen atom, an alkyl group, a cycloalkyl group, an alkenyl group, an aryl group, an alkoxy group, an aryloxy group, an aralkyl group, an acyl group, an acylamino group, an alkylsulfonylamino group, an arylsulfonylamino group, an alkoxyalkyl group, an aryloxyalkyl group, an acyloxy group, an acyloxyalkyl group, a carbamoyl group, an N-substituted carbamoyl group, a ureido group, an N-substituted ureido group, an alkylamino group, a dialkylamino group, an arylamino group, a halogen atom, a hydroxy group, a carboxy group, a nitro group, a cyano group, an alkoxycarbonyl group, an aryloxycarbonyl group, or a cycloalkyloxycarbonyl group; and R^1 represents an alkyl group, an alkenyl group, a cycloalkyl group or an aryl group.

4,536,468

METHOD OF FORMING RESIST PATTERN

Toshihiko Yasui, Iruma; Tetsuo Matsumoto, Tokyo, and Akihiko Akaike, Ageo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

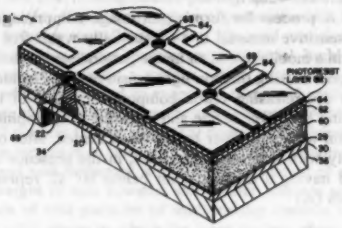
Filed May 3, 1984, Ser. No. 606,609
Claims priority, application Japan, May 6, 1983, 58-78241
Int. Cl.³ G03C 5/00
U.S. Cl. 430—296 26 Claims

1. A method of forming a resist pattern, which comprises printing a predetermined pattern on a substrate by a lithographic technique using a resist ink curable by irradiation of an active energy ray and/or heating, said ink consisting essentially of (1) 100 parts by weight of a metal chelate resin obtained by reacting (a) 100 parts by weight of at least one resin having an acid value of 5 to 300 selected from the group consisting of alkyd resins, modified alkyd resins, fatty acid-modified epoxy resins, urethanized oils and maleinized oils and (b) 0.1 to 10 parts by weight of at least one metal compound selected from the group consisting of long chain fatty acid metal salts, metal alcoholates and intramolecular metal complex compounds and (2) 3 to 300 parts by weight of a polymerizable compound containing at least two ethylenically unsaturated bonds per molecule; and curing the printed pattern by irradiating with an acitve energy ray and/or by heating.

4,536,469
SEMICONDUCTOR STRUCTURES AND MANUFACTURING METHODS

Michael G. Adlerstein, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 23, 1981, Ser. No. 323,781
Int. Cl.³ G03C 5/00; H01L 29/06
U.S. Cl. 430—314 13 Claims



1. A method for forming a semiconductor device comprising the steps of:

providing, to a first predetermined thickness, a layer of a thermally conductive material onto a semiconductor;

providing a mask over the thermally conductive material providing exposed portions and at least one masked portion of the thermally conductive material;

providing, to a second predetermined thickness, a layer of a support material over the exposed portions of the thermally conductive material, the thickness of said support layer being substantially greater than the thickness of the conductive layer;

forming at least one semiconductor element from the semiconductor over the masked portion of the thermally conductive material; and

separating the semiconductor element from the support material to provide the semiconductor device having an electrical contact with a thickness equal to the thickness of the thermally conductive layer.

4,536,470
METHOD AND APPARATUS FOR MAKING A MASK CONFORMING TO A CERAMIC SUBSTRATE METALLIZATION PATTERN

Albert Amendola, Hopewell Junction; Richard G. Christensen, Wingdale, and John G. Yereance, Jr., Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 415,051, Sep. 7, 1982, Pat. No. 4,474,465. This application Dec. 12, 1983, Ser. No. 560,703
Int. Cl.³ G03F 7/02, 9/00
U.S. Cl. 430—314 6 Claims

1. A method of forming a metallization pattern in conformity with an original metallization pattern on a cured multilayer ceramic substrate, said method comprising:

providing a cured multilayer ceramic substrate having an original metallization pattern on at least one principal surface thereof;

forming a rigid custom tailored negative photographic mask bearing the image of the cured multilayer ceramic substrate and the original metallization pattern thereon;

forming a blanket metal layer on said cured substrate including said original metallization pattern;

providing a radiation sensitive film on said blanket metal layer;

aligning the custom mask with the cured substrate having the blanket metal layer and radiation sensitive film thereon such that the mask image pattern is in exact alignment with the original metallization pattern;

exposing the radiation sensitive film through said custom mask to transfer the mask image pattern to the film;

developing said radiation sensitive film to form a patterned mask of said film on said metal layer in complete and exact correspondence with said original metallization pattern; and

etching said metal layer in accordance with said patterned mask.

4,536,471
OPTICAL INFORMATION RECORDING MEDIUM

Shinichi Nishi, Hino; Taxey Satoh, Hachioji; Fumio Shimada, Hamura, and Toshiaki Takahashi, Musashimurayama, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1984, Ser. No. 590,000
Claims priority, application Japan, Mar. 16, 1983, 58-42202
Int. Cl.³ G03C 1/00
U.S. Cl. 430—495 16 Claims

1. An optical information recording medium for recording and reproducing information by way of applying high density energy beams to a reflective recording layer on a support, wherein said reflective recording layer comprises a hydrophilic colloid; a compound capable of producing a water-insoluble copper complex; and reflective fine particles consisting essentially of copper.

4,536,472
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hirohiko Kato; Seiji Ichijima; Keiichi Adachi, and Toshiyuki Watanabe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 19, 1984, Ser. No. 572,049
Claims priority, application Japan, Jan. 19, 1983, 58-7152
Int. Cl.³ G03C 1/46
U.S. Cl. 430—505 14 Claims

1. A silver halide color photographic light-sensitive material exhibiting improved RMS granularity and an improved visual sensation of graininess comprising a support having thereon a blue-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer and a red-sensitive silver halide emulsion layer at least one of these silver halide emulsion layers containing a non-diffusible coupler which forms a properly smearing diffusible dye upon reaction with the oxidation product of a color developing agent together with a monodispersed silver halide emulsion having an average grain size of from 0.1 micron to 3 microns and wherein the monodispersed silver halide emulsion is a silver iodobromide emulsion containing 2% by mole or more of silver iodide.

4,536,473
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yuji Mihara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 11, 1984, Ser. No. 659,935
Claims priority, application Japan, Oct. 11, 1983, 58-189554
Int. Cl.³ G03C 1/02
U.S. Cl. 430—575 32 Claims

1. A silver halide photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer which comprises silver halide grains containing at least silver chloride and spectrally sensitized to infrared rays with at least one dye selected from a tricarbocyanine dye and a dicarbocyanine dye having a 4-quinoline nucleus, wherein the silver halide emulsion layer contains from 0.0003 mol to 0.01 mol per mol of silver of a water-soluble bromide.

4,536,474

TISSUE CULTURE OF LICHENS

Yoshikazu Yamamoto; Ryuzo Mizuguchi, both of Neyagawa, and Yasuyuki Yamada, Uji, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Sep. 30, 1982, Ser. No. 431,096

Claims priority, application Japan, Sep. 30, 1981, 56-156765; Oct. 27, 1981, 56-172605; Oct. 27, 1981, 56-172606

Int. Cl.³ C12P *39/00, 19/04, 17/18, 17/02, 7/62, 7/40, 7/44, 7/42, 7/26, 7/22, 17/08, 17/06, 17/04, 7/64;* C12N *5/00;* C12R *1/645, 1/89;* A01G *7/00;* A01H *13/00;* A01B *79/00;* A01C *1/00*

U.S. Cl. 435—42 9 Claims

1. A process for preparing aromatic lichenous substances which consists essentially of culturing an undifferentiated symbiotic combination of alga and fungus cells obtained directly from a lichen explant in a culture media under appropriate conditions and for a sufficient period of time to allow production of at least one of the said lichenous substances and recovering at least one of said lichenous substances from said media.

4,536,475

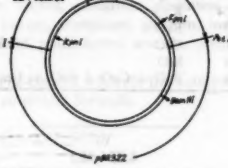
PLANT VECTOR

David M. Anderson, Duarte, Calif., assignor to Phytogen, Pasadena, Calif.

Filed Oct. 5, 1982, Ser. No. 432,842

Int. Cl.³ C12N *15/00, 1/00*

U.S. Cl. 435—172.3 7 Claims



1. A vector precursor comprising the Pst I cleaved left and right border fragments of the T region of the Ti plasmid *Agrobacterium tumefaciens* strain of C58 interligated and ligated into the Pst I site of plasmid pBR322.

4,536,476

STABLE EPIMERASE REAGENT, CYCLASE REAGENT AND RING EXPANSION REAGENT FOR CELL-FREE PRODUCTION OF CEPHALOSPORINS

Saul Wolfe, Kingston; Donald Westlake, and Susan Jensen, both of Edmonton, all of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation-in-part of Ser. No. 410,302, Aug. 23, 1982, Pat. No. 4,510,246. This application Jun. 27, 1983, Ser. No. 507,852

Int. Cl.³ C12N *9/00, 9/06;* C12P *37/00, 35/00*

U.S. Cl. 435—183 9 Claims

1. A stable epimerase reagent containing epimerase having a molecular weight of about 60,000 capable of epimerizing isopenicillin N and analogs thereof to penicillin N and analogs thereof, derived from a cell free extract of a prokaryotic beta-lactam producing organism, said epimerase being separated from cyclase having a molecular weight of about 36,500 capable of cyclizing L-aminoadipyl-L-cysteinyl-D-valine and analogs thereof to isopenicillin and analogs thereof, and from a ring expansion enzyme having a molecular weight of about 29,000 and capable of ring expanding penicillin N and analogs thereof to desacetoxycephalosporin and analogs thereof.

4. A stable cyclase reagent containing cyclase having a molecular weight of about 36,500 capable of cyclizing L-aminoadipyl-L-cysteinyl-D-valine and analogs thereof to isopenicillin N and analogs thereof, derived from a cell free extract of a prokaryotic beta-lactam producing organism, said cyclase being separated from epimerase having a molecular weight of about 60,000 capable of epimerizing isopenicillin N and analogs thereof to penicillin N and analogs thereof, and from a ring expansion enzyme having a molecular weight of about 29,000 and capable of ring expanding penicillin N and analogs thereof to desacetoxycephalosporin and analogs thereof.

7. A stable ring expansion enzyme reagent containing a ring expansion enzyme having a molecular weight of about 29,000 and capable of ring expanding penicillin N and analogs thereof to desacetoxycephalosporin and analogs thereof, derived from a cell free extract of a prokaryotic beta-lactam producing organism, said epimerase being separated from cyclase having a molecular weight of about 36,500 capable of cyclizing L-aminoadipyl-L-cysteinyl-D-valine and analogs thereof to isopenicillin and analogs thereof and epimerase having a molecular weight of about 60,000 capable of epimerizing isopenicillin N and analogs thereof to penicillin N and analogs thereof.

4,536,477

THERMOSTABLE GLUCOAMYLASE AND METHOD FOR ITS PRODUCTION

Dennis M. Katkocin, Danbury, Conn.; Nancy S. Word, Woodridge, and Shiow-Shong Yang, Downers Grove, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Aug. 17, 1983, Ser. No. 524,070

Int. Cl.³ C12N *9/34;* C12P *19/20;* C12R *1/145*

U.S. Cl. 435—205 9 Claims

1. A glucoamylase enzyme derived from a *Clostridium thermoamylolyticum* microorganism, said enzyme having a molecular weight of about 75,000±3,000 as determined by SDS-polyacrylamide gel electrophoresis, having a half-life of greater than 3 hours at pH 6 and 70° C., having a maximum glucoamylase activity at a pH of about 5.0, and having a maximum glucoamylase activity at pH 5 at a temperature of about 70°–75° C.

4,536,478

METHOD FOR REDUCING NON-SPECIFIC INTERFERENCES IN AGGLUTINATION IMMUNOASSAYS

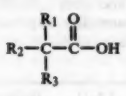
Roger L. Sokoloff, Indianapolis, and John M. Reno, Zionsville, both of Ind., assignors to Seragan Diagnostics, Inc., Indianapolis, Ind.

Filed Apr. 5, 1984, Ser. No. 597,129

Int. Cl.³ G01N *33/54, 33/76*

U.S. Cl. 436—533 5 Claims

1. In an agglutination immunoassay for an analyte in a fluid sample which is combined with a reagent which includes sensitized latex particles and binding partner as required, whereby the degree of agglutination of the particles is a measure of the analyte in the sample, the improvement comprising the step of adding to the reaction mixture an additive to decrease non-specific interferences of the agglutination of the particles, where such additives comprise at least one halogen substituted carboxylic acid or water soluble salt thereof wherein the acid has the formula:



and wherein R_1 is Cl, Br or I and R_2 is H, Cl, Br or I and R_3 is H, CH_3—, CH_3CH_2—, Cl, Br or I.

4,536,479

USE OF ANTI-IDIOTYPE ANTIBODIES IN IMMUNOASSAYS

Ronald Vander-Mallie, Nashua, N.H., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 22, 1983, Ser. No. 477,611
Int. Cl.[3] G01N *33/54, 33/52*
U.S. Cl. 436—537 4 Claims

1. A homogeneous immunoassay for the detection of a nonimmunoglobulin analyte in a test sample, comprising:

(1) contacting the test sample with reagents comprising:

(a) a first covalent conjugate comprising a first enzyme and an idiotypic anti-analyte antibody;

(b) a second covalent conjugate comprising a second enzyme and an anti-idiotypic antibody capable of competing with the analyte for the idiotypic anti-analyte antibody;

(c) a substrate for the first and or second enzyme wherein one of the enzymes and the substrate are capable of reacting to produce a first product, which product is a substrate for the other enzyme, which is capable of reacting with the first product to produce a second, detectable product; and

(2) measuring the amount of second product which is inversely related to the amount of analyte initially present in the test sample.

3. A homogeneous immunoassay for the detection of a nonimmunoglobulin analyte in a test sample comprising:

(1) forming a reaction mixture by contacting the test sample with reagents, comprising:

(a) a first covalent conjugate comprising a first fluorophore and an idiotypic anti-analyte antibody; and

(b) a second covalent conjugate comprising a second fluorophore and an anti-idiotypic antibody capable of competing with the analyte for the idiotypic anti-analyte antibody;

wherein one of the fluorophores is capable of absorbing incident light at a wavelength λ_{inc} to produce light emission at wavelength λ_{em1} which can be absorbed by the other fluorophore to produce emission at wavelength λ_{em2};

(2) irradiating the reaction mixture with light of wavelength λ_{inc}; and

(3) measuring the intensity of light of wavelength λ_{em1} or λ_{em2}, which intensity is related to the amount of analyte initially present in the test sample.

4,536,480

OPAL GLASSES HAVING AN APATITE OPACIFYING PHASE

James E. Flannery, Corning; John L. Stempin, Beaver Dams, and Dale R. Wexell, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,929
Int. Cl.[3] C03C *3/08, 3/30*
U.S. Cl. 501—32 3 Claims

1. A white spontaneous opal glass exhibiting a softening point of at least 710° C., excellent chemical durability, a temperature interval between the high temperature crystallization liquidus and the emulsion liquidus of at least 50° C., and containing as the predominant crystal phase at least one apatite-type crystal selected from the group of $Ca_5F(PO_4)_3$, $Sr_5F(PO_4)_3$, $Ba_5F(PO_4)_3$, $(Ca_{5-x}Ba_x)F(PO_4)_3$ solid solution, $(Sr_{5-x}Ba_x)F(PO_4)_3$ solid solution, $(Ca_{5-x}Sr_x)F(PO_4)_3$ solid solution, $(Sr_{5-x}Ca_x)F(PO_4)_3$ solid solution, $(Ba_{5-x}Ca_x)F(PO_4)_3$ solid solution, and $(Ba_{5-x}Sr_x)F(PO_4)_3$ solid solution, said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of

	Na_2O	7.5–11	B_2O_3	2–4.5
	K_2O	0–5	SiO_2	57–65
Na_2O +	K_2O	≦13	P_2O_5	2–5.5
	BaO	0–9.5	F	1.5–4
	CaO	0–3	SrO	0–5
	ZnO	0.4–5	MgO	0–2.5
	Al_2O_3	8–13	SrO + MgO	0–5

CaO and/or SrO and/or BaO at least 2.5 mole %.

4,536,481

OPAL GLASSES HAVING AN APATITE OPACIFYING PHASE

James E. Flannery, Corning; John L. Stempin, Beaver Dams, and Dale R. Wexell, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,960
Int. Cl.[3] C03C *3/08, 3/10, 3/30*
U.S. Cl. 501—32 3 Claims

1. A spontaneous opal glass exhibiting a dense white appearance, a softening point of at least 740° C., excellent chemical durability, a temperature interval between the high temperature crystallization liquidus and the emulsion liquids greater than 50° C., and containing as the predominant crystal phase a member selected from the group of $Ca_5F(PO_4)_3$, $Sr_5F(PO_4)_3$, $Ba_5F(PO_4)_3$, $(Ca_{5-x}Ba_x)F(PO_4)_3$ solid solution, $(Sr_{5-x}Ba_x)F(PO_4)_3$ solid solution, $(Ca_{5-x}Sr_x)F(PO_4)_3$ solid solution, $(Sr_{5-x}Ca_x)F(PO_4)_3$ solid solution, $(Ba_{5-x}Ca_x)F(PO_4)_3$ solid solution, and $(Ba_{5-x}Sr_x)F(PO_4)_3$ solid solution, said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2	50–63	Na_2O	5.5–10
Al_2O_3	10–14	K_2O	0–10
P_2O_5	3.5–7	BaO	0–10
PbO	2–12	CaO	0–2.5
B_2O_3	1–4	SrO	0–8
F	1.5–4	BaO + CaO + SrO At Least 3 mole %	

4,536,482

CATALYST COMPOSITION

Peter F. Carcia, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 475,031, Mar. 14, 1983, abandoned. This application Oct. 31, 1984, Ser. No. 667,057
Int. Cl.[3] B01J *35/10, 37/02*
U.S. Cl. 502—5 8 Claims

1. A composite catalyst comprising a particulate support having a surface area of less than 10 m^2/g and a particle size of greater than 100 μm having sputtered on the surface thereof and intimately adhered thereto from 0.01 to 5.0 weight percent as based on the total catalyst of a catalytically active metal and a cosputtered support material in such amount that the catalytically active metal comprises from 3–80 volume percent of the sputtered material.

4,536,483

PROCESS FOR REGENERATION OF IRON-ANTIMONY METALLIC OXIDE CATALYSTS

Yutaka Sasaki; Yutaka Kiyomiya; Toshio Nakamura; Yoshimi Nakamura, and Masanori Yamaguchi, all of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,713
Claims priority, application Japan, Oct. 26, 1982, 57-186745
Int. Cl.[3] B01J *27/30, 23/94;* C07C *121/32, 120/14*
U.S. Cl. 502—20 9 Claims

1. A process for regenerating an iron-antimony metallic oxide catalyst containing as essential components (I) Fe, (II) Sb, (III) at least one element selected from the group consisting of V, Mo, and W and (IV) Te, which has become deactivated after being used for the production of nitriles through ammoxi-

dation or hydrocarbons or alcohols in fluidized-bed reactors, said process comprising adding to said catalyst dry solid molybdenum or a dry solid molybdenum compound which is volatile or capable of forming a volatile compound under reaction conditions in such an amount that the apparent content of molybdenum in the catalyst increases by 0.1 to 2 wt%, and performing the ammoxidation in the presence of the mixture of said deactivated catalyst and said solid molybdenum or molybdenum compound, wherein said molybdenum or solid molybdenum compound is not supported on an inert carrier, wherein said solid molybdenum compound is selected from the group consisting of molybdenum dioxide, molybdenum trioxide, molybdic acid, ammonium molybdate, ammonium paramolybdate, phosphomolybdic acid, ammonium phosphomolybdate, heteropoly acids or molybdenum and salts thereof, molybdenum disulfide, molybdenum trisulfide, molybdenum dichloride, molybdenum trichloride, molybdenum pentachloride, and organic molybdenum compounds which are solid at ordinary temperature, wherein the catalyst is in the form of particles having a diameter of 1 to 500 microns, the solid dry molybdenum or solid dry molybdenum compound is in the form of particles having a diameter of 0.1 to 5,000 microns, and the catalyst is mixed with the solid dry molybdenum or solid dry molybdenum compound when the catalyst is in a fluidized state.

2. The process according to claim 1, wherein the iron-antimony metallic oxide catalyst is a metal oxide catalyst containing, in addition to said components (I) to (IV), (V) at least one element selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, calcium, strontium, barium, yttrium, lanthanum, cerium, thorium, uranium, titanium, zirconium, hafnium, niobium, tatalum, chromium, manganese, rhenium, ruthenium, osmium, cobalt, rhodium, iridium, nickel, palladium, platinum, copper, silver, zinc, cadmium, boron, aluminum, gallium, indium, thallium, germanium, tin, lead, phosphorus, arsenic, bismuth, sulfur, and selenium.

3. The process of claim 1 wherein the catalyst prior to deactivation has the empirical formula:

$$Fe_{10}Sb_aMe_bTe_cQ_dO_e(SiO_2)_f$$

where,

Me is at least one element selected from the group consisting of V, Mo, and W;

Q is at least one element selected from the group consisting of Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, Ba, Y, La, Ce, Th, U, Ti, Zr, Hf, Nb, Ta, Cr, Mn, Re, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Zn, Cd, B, Al, Ga, In, Tl, Ge, Sn, Pb, P, As, Bi, S, and Se;

a is 2 to 100,

b is 0.01 to 20,

c is 0.05 to 10,

d is 0 to 20,

e is the number of oxygen atoms corresponding to the oxides formed by the above components, and

f is 0 to 200.

4,536,484

PROCESS FOR PREPARATION OF A TRANSITION METAL COMPONENT FOR A CATALYTIC SYSTEM OF POLYMERIZATION OF OLEFINS

Jean-Loup Lacombe, Pau, and Claude Brun, Idron Bizanos, both of France, assignors to Atochem, Courbevoie, France

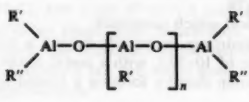
Filed May 25, 1984, Ser. No. 614,279

Claims priority, application France, May 25, 1983, 83 08603

Int. Cl.³ C08F 4/62, 4/64, 4/68

U.S. Cl. 502—62 **36 Claims**

1. A process for the preparation of a transition metal component for a catalytic system for the polymerization of olefins, wherein an organo-magnesium-aluminum reaction product is formed in a liquid medium of a halogenated alkylated magnesium compound or an alkylated magnesium compound with an organoaluminum compound, the reaction product being then subjected to a chlorination and to a treatment with a transition metal component selected from the group consisting of Ti, V, Zr and Cr, characterized by using as an organo-aluminum compound, at least one aluminoxane compound of the formula



wherein R′ designates an alkyl radical of from C_1 to C_{16}, the R″s form together a bivalent —O— radical or designate each an R′ radical and n is an integer from 0 to 20.

11. A process according to claim 1, characterized in that the reaction between said magnesium compound and said aluminoxane compound is carried out at a temperature going from about −30° C. to the boiling temperature under atmospheric pressure of the reaction liquid medium.

12. A process according to claim 11, characterized in that the reaction product between the magnesium compound and the aluminoxane compound is subjected to a chlorination and the product resulting from said chlorination is then treated with the transition metal compound.

14. A process according to claim 12, characterized in that an adjuvant consisting of an inorganic or organic porous carrier is incorporated into the reaction product between the magnesium compound and the aluminoxane compound, said incorporation being effected either during the formation of the reaction medium between said components or during the reaction, or even when the reaction is finished.

19. A process according to claim 14, characterized in that the adjuvant is selected from the group consisting of SiO_2, TiO_2, Al_2O_3, ZrO_2, the zeolites and the mixed oxides containing SiO_2 and one or more metal oxides of the group consisting of ZrO_2, TiO_2 MgO and Al_2O_3.

4,536,485

PROCESS FOR THE PREPARATION OF CATALYSTS FOR USE IN ETHER SYNTHESIS

Jorgen Topp-Jorgensen, Hvidovre, Denmark, assignor to Haldor Topsoe A/S, Denmark

Filed Jan. 10, 1985, Ser. No. 690,335

Claims priority, application Denmark, Jan. 10, 1984, 95/84

Int. Cl.³ B01J 29/08, 29/28, 21/16

U.S. Cl. 502—62 **13 Claims**

1. A process for the preparation of an aluminosilicate catalyst for use in the catalytic dehydration of alcohols into ethers, wherein the improvement consists in the steps of

(a) contacting a crystalline aluminosilicate at a temperature below 800° C. with at least one nitrogen-containing base and carrying out this treatment until no more of such base is absorbed, and then

(b) subjecting the crystalline aluminosilicate thus treated to an after-treatment consisting in passing a stream of an inert gas over it at a temperature of 320°–800° C. to desorb part of any nitrogen-containing base absorbed, this after-treatment being carried out until desorption no longer takes place.

2. The process claimed in claim 1, wherein the nitrogen-containing base employed is ammonia.

3. The process claimed in claim 1, wherein the nitrogen-containing base employed is at least one lower alkyl amine.

5. The process claimed in claim 1, wherein the crystalline aluminosilicate is a zeolite.

7. The process claimed in claim 5, wherein the zeolite is Y-zeolite.

4,536,486

PROCESS FOR DEWAXING WITH MORDENITE

Paul H. Lewis, Groves, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 31, 1983, Ser. No. 480,640
Int. Cl.[3] B01J 29/22
U.S. Cl. 502—74 11 Claims

1. The method which comprises

loading a hydrogen mordenite having a silica-to-alumina mole ratio of 10–50:1, with a metal of the platinum-palladium group thereby forming a loaded hydrogen mordenite;

calcining said loaded hydrogen mordenite at 1300° F.–1500° F., after the catalyst has been exposed to water for the last time, thereby forming a calcined loaded hydrogen mordenite containing activated sites; and

recovering said calcined loaded hydrogen mordenite containing activated sites.

4,536,487

INTERMETALLIC COMPOUNDS OF POLYMERIC TRANSITION METAL OXIDE ALKOXIDES AND CATALYTIC USE THEREOF

Anthony N. Speca, Kingwood, Tex., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 209,223, Nov. 24, 1980, abandoned, Ser. No. 209,224, Nov. 24, 1980, abandoned, Ser. No. 209,225, Nov. 24, 1980, abandoned, Ser. No. 209,226, Nov. 24, 1980, abandoned, Ser. No. 209,227, Nov. 24, 1980, abandoned, Ser. No. 209,228, Nov. 24, 1980, abandoned, Ser. No. 209,229, Nov. 24, 1980, abandoned, Ser. No. 228,831, Jan. 27, 1981, abandoned, and Ser. No. 483,054, Apr. 7, 1983, Pat. No. 4,513,095. This application Feb. 8, 1984, Ser. No. 578,243
Int. Cl.[3] C08F 4/64
U.S. Cl. 502—119 21 Claims

1. An intermetallic compound comprising the reaction product of a transition metal and a reducing metal of a higher oxidation potential than the transition metal obtained by the reaction at elevated temperature of a polymeric transition metal oxide alkoxide and the reducing metal in the presence of a mono- or dialkyl phosphate or mixtures thereof in which each alkyl contains up to 10 carbon atoms.

11. A catalyst component for polymerization of alpha olefins comprising the intermetallic compound of any of claims 1–6 further reacted with a halide activator selected from the group consisting of alkyl aluminum halides, silicon halides, alkyl silicon halides titanium halides, boron halides and alkyl boron halides.

13. A catalyst system for the polymerization of alpha olefins comprising the catalyst component of claim 11 and an organo aluminum compound.

4,536,488

METHOD OF MANUFACTURING A CRYSTALLINE SILICA/PLATINUM CATALYST STRUCTURE

Sieghard E. Wanke; Husseni A. Rangwala; Fred D. Otto; Ivo G. Dalla Lana, all of Edmonton; Linda M. Paterson, Petawawa, and John H. Rolston, Deep River, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Jun. 14, 1984, Ser. No. 620,572
Claims priority, application Canada, Oct. 24, 1983, 439528
Int. Cl.[3] B01J 31/06, 23/42; B01D 5/02
U.S. Cl. 502—159 4 Claims

1. A method of manufacturing a crystalline silica/platinum catalyst structure comprising:

(a) soaking a hydrophobic, porous, high surface area, crystalline silica (SiO_2) lattice essentially free of aluminum in the SiO_2 lattice, in an aqueous solution of $Pt(NH_3)_4Cl_2$ with added volatile amine in an amount sufficient to bring the pH of said solution to at least 9.5; the crystalline silica being a silica polymorph consisting of crystalline silica which, after calcination in air at 600° C. for one hour, has a mean refractive index of 1.39±0.01 and a specific gravity at 25° C. of 1.70±0.05 g/cc, then

(b) drying the soaked, hydrophobic, porous, high surface area, crystalline silica to leave catalyst crystallites of platinum from the aqueous solution of $Pt(NH_3)_4Cl_2$ on the crystalline silica and in the pores thereof, then

(c) reducing the catalyst crystallites by heating them in an atmosphere of hydrogen gas, then

(d) cooling the crystallites to room temperature in an inert atmosphere, then

(e) coating the crystalline silica, with the catalyst crystallites thereon and in the pores thereof, with high molecular weight, organic polytetrafluoroethylene polymeric material to provide an outer, porous membrane coating thereon which is inherently hydrophobic, to substantially inhibit the passage of water therethrough, and which is water vapour and gas permeable so that water vapour may pass therethrough.

2. A method according to claim 1 wherein sufficient volatile amine is added to the aqueous solution to bring the pH thereof in the range of 10.5 to 11.0.

4. A method according to claim 1, wherein the crystalline silica, with the catalyst crystallites on and in the pores thereof, is slurried with a fluid suspension of the high molecular weight, polytetrafluoroethylene organic, polymeric material, a ceramic support is coated with the slurry, and then the slurry coating is dried to leave a coating on the ceramic support comprising the crystalline silica, with the catalyst crystallites thereon and in the pores thereof, and coated with the high molecular weight, organic, polytetrafluoroethylene polymeric material.

4,536,489

HIGH PORE VOLUME, HIGH PURITY ALUMINA GELS CONTAINING A CHROMIUM CATALYST

Anthony N. Speca, Kingwood, Tex., and Roger D. Laib, Cincinnati, Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Filed Sep. 12, 1983, Ser. No. 531,096
Int. Cl.[3] B01J 21/04, 23/26, 31/12
U.S. Cl. 502—162 3 Claims

1. A catalyst system useful for the preparation of low molecular weight polyolefins comprising an alumina gel support material having an interparticle nitrogen pore volume of at least 1.4 to 1.8 cc/g and a surface area of 428 to 496 m^2/g and a chromium containing compound deposited on said alumina gel support, said alumina gel support material being prepared by a process comprising the steps of:

(i) hydrolyzing an aluminum alcoholate in a hydrolyzing medium comprised of a mixture of water and acetone having an H_2O/Al ratio of from about 15:1 to about 26:1;

(ii) aging the product of step (i) for about 4 hours to about 24 hours;

(iii) washing the resultant aged product from step (ii) with acetone; and

(iv) drying the product from step (iii).

4,536,490

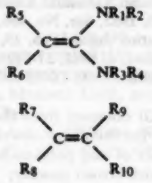
CATALYST COMPOSITIONS FOR TRIMERIZING ORGANIC ISOCYANATES

Dale F. Regelman, Wallingford, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 8, 1984, Ser. No. 587,429
Int. Cl.[3] C07D 251/34; C08G 18/18; B01J 31/02
U.S. Cl. 502—167 17 Claims

1. A composition capable of catalytically trimerizing an organic isocyanate said composition comprising a solution of the product obtained by reacting at ambient room temperature, in an inert solvent selected from the group consisting of polar aromatic solvents, halogenated aliphatic solvents, dipolar aprotic solvents, aliphatic alcohols, cycloaliphatic alcohols and organic polyols having a molecular weight from about 60 to

about 4000, substantially equimolar proportions of a keteneaminal and an olefin having the respective formulae (I) and (II)



(I)

(II)

wherein R_1, R_2, R_3, and R_4 when taken separately are independently selected from the group consisting of lower-alkyl, aralkyl, cycloalkyl, and, when taken together as R_1 with R_2 and R_3 with R_4 with the respective nitrogen atoms to which they are attached represent independently heterocyclic groups having 6 or 7 ring atoms, R_5 and R_6 are independently selected from the group consisting of hydrogen, lower-alkyl, aryl, aralkyl, and cycloalkyl, R_7 and R_8 when taken separately are independently selected from the group consisting of hydrogen, lower-alkyl, aryl, aralkyl, and cycloalkyl, provided that R_7 and R_8 are not both hydrogen at the same time, and, R_7 and R_8, when taken together with the carbon atom to which they are attached represent a cyclic hydrocarbon group having 5 or 6 carbon atoms in the ring, and R_9 and R_{10} represent the same or different electron withdrawing groups and wherein the combined weight of said (I) and said (II) is from about 5 to about 95 percent by weight in said solvent.

10. A composition according to claim 1 comprising a solution of the product obtained by reacting 1,1-bisacetyl-2-phenylethylene with 1,1-bis(N-piperidinyl)ethylene in an organic polyol.

17. A composition according to claim 1 comprising a solution of the product obtained by reacting benzylidene malononitrile with 1,1-bis(N-piperidinyl)-2-methylethylene in an organic polyol.

4,536,491
AGGLOMERATES OF MALACHITE CRYSTALS AND METHOD FOR THEIR PREPARATION

Joseph M. Fremont, Glen Mills, Pa., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Jun. 4, 1984, Ser. No. 617,072
Int. Cl.³ B01J *21/20*; C07C *33/046*
U.S. Cl. 502—174 **5 Claims**

1. An agglomerate of spheroidal masses of malachite crystals, which crystals comprise 1–7% by weight, of bismuth oxycarbonate and 0.5–3.5%, by weight (calculated as SiO_2) of silicic acid.

2. A mass of agglomerates of claim 1, the agglomerates having an average longest dimension of about 15 microns, with at least about 95% of the agglomerates having a longest dimension of 14 18 microns, and the spheroidal masses of malachite crystals having an average longest dimension of about 5 microns, with at least about 95% of the masses having a longest dimension of 3–8 microns.

3. A process for preparing agglomerates of spheroidal masses of malachite crystals, which crystals comprise 1–7%, by weight, of bismuth oxycarbonate and 0.5–3.5%, by weight (calculated as SiO_2), of silicic acid from a copper salt, a bismuth salt and silicic acid, the process comprising

(a) forming amorphous gel-like hydrated copper carbonate by bringing together, in aqueous solution, with agitation, at a temperature of about 45°–55° C., and at a pH of 5.5–7.5, maintained with an alkali metal carbonate or an alkali metal bicarbonate, about 30–60% by volume of the total amounts of the copper salt, the bismuth salt and the silicic acid required to form the malachite and to provide the specified amounts of bismuth oxycarbonate and silicic acid;

(b) holding the mass of (a), without agitation, at a temperature of about 45°–55° C. until masses of malachite crystals form;

(c) and then maintaining the resulting slurry at a temperature of 45°–55° C., and a pH of 5.5–7.5 with an alkali metal carbonate or an alkali metal bicarbonate, while adding, with agitation, the remainder of the required amount of copper salt, bismuth salt and silicic acid,

to form the agglomerates.

4,536,492
CATALYST FOR THE PREPARATION OF METHYL MERCAPTAN FROM CARBON OXIDES

Paul G. Haines, Lafayette Hill, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 431,858, Sep. 29, 1982, Pat. No. 4,449,006. This application Feb. 29, 1984, Ser. No. 584,860
Int. Cl.³ B01J *27/02*
U.S. Cl. 502—216 **4 Claims**

1. A composition of matter comprising a solid catalyst system of from 10 to about 90%, based on the weight of said system, of a support comprising alumina upon which is deposited from about 90 to about 10%, based on the weight of said system, of a mixture of:

(a) from 2 to 95%, based on the weight of said mixture, of the sulfide of manganese,

(b) from 0 to 90% of at least one sulfide selected from the group consisting of sulfides of iron, nickel, zinc and chromium, and

(c) from 5 to 80%, based on the weight of said mixture, of an alkali metal sulfide, the total of (a), (b) and (c) equaling 100%.

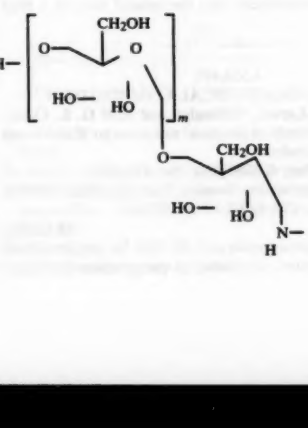
4,536,493
SATURATED AMINOCYCLITOL DERIVATIVES, THEIR PREPARATION AND MEDICAMENTS CONTAINING THESE COMPOUNDS

Bodo Junge, Wuppertal, Fed. Rep. of Germany, and Lutz Müller, Elkhart, Ind., assignors to Baker Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,222
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123520
Int. Cl. A61K *31/70*; C07G *11/00*
U.S. Cl. 514—25 **15 Claims**

1. A compound which is a saturated aminocyclitol derivative of the formula

(I)



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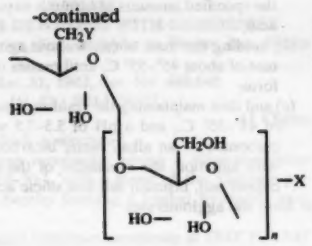
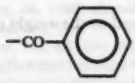


in which

m and n independently of each other denote 0 or an integer from 1 to 8 and the sum of m+n has a value from 0 to 8,

X represents OH, OR, SH, SR, NH_2, NHR or NRR_1, and

R and R_1 independently represent a straight chain or branched, saturated or unsaturated alkyl radical with 1 to 8 carbon atoms; a saturated or unsaturated carbocyclic radical with 3 to 6 carbon atoms; an aralkyl radical consisting of an alkylen- or -alkenylen-chain having 1 to 3 carbon atoms and an optionally substituted phenyl ring with one or two substituents selected from OH, NH_2, Cl, CH_3, NO_2, COOH; an optionally substituted pheny ring with one or two substituents selected from -OH, -Cl, $-CH_3$, -NO2, -COOH or



together with the nitrogen atom to which they are bonded form a heterocyclic five- or six membered ring, selected from pyrrolidine, piperidine, piperazine, hexamethyleneimine, morpholine and N-methylpiperazine.

10. A pharmaceutical composition for inhibiting alpha-glycoside hydrolase, containing as an active ingredient in amount of a compound according to claim 1 effective for inhibiting α-glucoside hydrolase in admixture with an inert pharmaceutical carrier.

14. A method of inhibiting α-glycoside hydrolases in warm-blooded animals which comprises administering to the said animals in amount of an active compound according to claim 1 effective for inhibiting α-glycoside hydrolase either alone or in admixture with a diluent or in the form of a medicament.

4,536,494

ANIMAL FEED METHOD EMPLOYING NATAMYCIN

A. Franklin Carter, 705 E. Highpoint, Springfield, Mo. 65807

Continuation-in-part of Ser. No. 552,771, Nov. 17, 1983, abandoned. This application May 10, 1984, Ser. No. 608,796

Int. Cl.[3] A61K *31/71*; C07H *17/08*

U.S. Cl. 514—31 **9 Claims**

1. A method for improving the use of animal feed by an animal which comprises incorporating about 0.000055 to 0.011 weight percent of natamycin into the animal feed as a feed efficiency agent.

4,536,495

NOVEL PHARMACEUTICAL COMPOSITION

Carl-Aage Bergwitz-Larsen, Villingby, and Rolf G. L. Österlund, Vallentuna, both of Sweden, assignors to KabiVitrum AB, Stockholm, Sweden

Filed Mar. 4, 1983, Ser. No. 472,295

Claims priority, application Sweden, Mar. 12, 1982, 8201556

Int. Cl.[3] A61K *31/70, 31/14*

U.S. Cl. 514—54 **16 Claims**

1. A complex of carrageenan and 10–70% by weight of said complex of emepronium, calculated as emepronium bromide.

4,536,496

POLYSACCHARIDES N9GI, THEIR PREPARATION AND THERAPEUTIC COMPOSITIONS CONTAINING THEM

Masaki Shimizu, Tokyo, and Takeo Nomura, Hino, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1983, Ser. No. 466,553

Claims priority, application Japan, Feb. 19, 1982, 57-25440; Feb. 19, 1982, 57-25441; Dec. 4, 1982, 57-212104

Int. Cl.[3] C08B *37/00*; C07H *1/00*

U.S. Cl. 514—54 **20 Claims**

1. Polysaccharide N9GI obtained from the bark of *Melia azadirachta L.* which has the following characteristics:

the freeze dried product of said polysaccharide N9GI is a white or pale yellowish brown powder;

said polysaccharide N9GI;

has an infrared absorption spectrum as shown in FIG. 1, wherein $IR\nu_{max.}^{KBr}cm.^{-1}$: 3400, 1630, 1030;

has an ultraviolet absorption spectrum which shows no absorption maximum with end absorption only when measured in an aqueous solution;

is soluble in water and insoluble in organic solvents selected from methanol, ethanol, acetone, ether, chloroform, ethyl acetate, benzene, and hexane;

reacts with phenol sulfate and anthrone sulfate; and

turns greenish blue by reaction with iodine;

said polysaccharide N9GI is a mixture of polysaccharide N9GIa and of polysaccharide N9GIb;

said polysaccharide N9GIa;

is a neutral polysaccharide which contains as the main chain thereof an α-(1→4)-glucan connected to arabinose by an α-(1→6) bond and is composed of glucose and arabinose at a ratio of about 5:1;

is soluble in water and insoluble in organic solvents selected from methanol, ethanol, acetone, ether, chloroform, ethyl acetate, benzene and hexane;

reacts with phenol sulfate and anthrone sulfate;

turns to greenish blue by reaction with iodine;

when analyzed by column gel chromatography using dextran gel with a fractionation range molecular weight of 1×10^3–2×10^5 gives a single peak with a molecular weight of about 94,000;

has a specific rotation of $(\alpha)_D^{22}$: −35° (c=0.4, H_2O);

has an infrared absorption spectrum as shown in FIG. 2, wherein $IR\nu_{max.}^{KBr}cm.^{-1}$: 3400, 2930, 1620;

has an ultraviolet absorption spectrum which shows no absorption maximum with end absorption only when measured in an aqueous solution; and

has a 100 MHz ^{13}C nuclear magnetic resonance spectrum measured in deuterium oxide using TMS (tetramethylsilane) as the external standard as shown in FIG. 4; and

said polysaccharide N9GIb;

is a neutral polysaccharide which contains as the main chain thereof an α-(1→4)-glucan interspersed with β-(1→3)-fucose and branched with α-(1→6)-arabinose and is composed of glucose, arabinose and fucose at a ratio of about 5:2:1;

is soluble in water and insoluble in organic solvents selected from methanol, ethanol, acetone, ether, chloroform, ethyl acetate, benzene, and hexane;

reacts with phenol sulfate and anthrone sulfate;

turns greenish blue by reaction with iodine;

when analyzed by column gel chromatography using dextran gel with a fractionation range molecular weight of 1×10^3–2×10^5 gives a single peak with a molecular weight of about 21,000;

has a specific rotation of $(\alpha)_D^{22}$: −46° C. (c=0.28, H_2O);

has an infrared absorption spectrum as shown in FIG. 4, wherein $IR\nu_{max.}^{KBr}cm.^{-1}$: 3400, 2930, 1630;

has an ultraviolet absorption spectrum which shows no absorption maximum with end absorption only when measured in an aqueous solution;

has a 100 MHz ^{13}C nuclear magnetic resonance spectrum measured in deuterium oxide using TMS (tetramethylsilane) as the external standard as shown in FIG. 5.

2. A therapeutic composition characterized by inhibiting the growth of Sarcoma 180 transplanted tumor tissue in mice comprising an effective amount of the polysaccharide according to claim 1 and a pharmaceutical diluent.

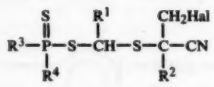
4,536,497

S-(1-(1-CYANO-1-(HALOMETHYL)ALKYLTHIO)ALKYL) PHOSPHOROTHIOIC COMPOUNDS AS PESTICIDES

James R. Sanborn, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 5, 1983, Ser. No. 520,883
Int. Cl.³ A01N *57/12;* **C07F** *9/165*
U.S. Cl. 514—112 **9 Claims**

1. A compound of the formula I



I

wherein R^1 and R^2 each independently is a methyl group or an ethyl group; R^3 and R^4 each independently is an alkoxy group containing from 1 to 4 carbon atoms and Hal is a chlorine or bromine atom.

7. A method for combating pests at a locus, which comprises applying to the locus or the pests, a pesticidally-effective amount of a compound according to claim 1.

4,536,498

FUNGICIDAL COMPOSITION

Manabu Tagami, Nishinomiya; Kenzi Urayama; Tadashi Ooishi, both of Toyonaka; Yukikazu Okamoto, Ikeda, and Kozo Tsuji, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 7, 1983, Ser. No. 558,829
Claims priority, application Japan, Dec. 15, 1982, 57-220966
Int. Cl.³ A01N *57/02*
U.S. Cl. 514—147 **2 Claims**

1. A fungicidal composition which comprises 1–70 parts of tolchlofos-methyl as an active ingredient, 5–40 parts of polypropylene glycol having a molecular weight from 400 to 6,000 as a stabilizer, and as the sole carrier the remainder of the composition being attapulgite clay, wherein the amount of said polypropylene glycol is from 10 to 60% by weight of the amount of attapulgite clay.

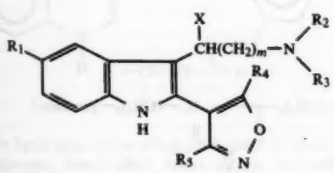
4,536,499

ISOXAZOLYL INDOLAMINES HAVING ANTI-DIABETIC ACTIVITY

Leonard J. Brand, Randolph, and Jeffrey Nadelson, Denville, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 367,938, Apr. 13, 1982, abandoned. This application Apr. 1, 1983, Ser. No. 481,373
The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.
Int. Cl.³ C07D *413/04, 413/14;* **A61K** *31/40*
U.S. Cl. 514—212 **20 Claims**

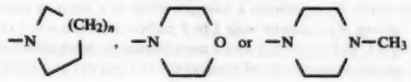
1. A compound of the formula



(I)

where

m is 2, 3, or 4,
X is hydrogen or hydroxy,
R_1 represents hydrogen, fluoro, chloro, lower alkyl having 1 to 4 carbon atoms, or lower alkoxy having 1 to 4 carbon atoms, and
R_2 and R_3 each independently represent lower alkyl having 1 to 4 carbon atoms, or
R_2 and R_3 together with N represent



wherein
n is 1, 2 or 3, and
R_4 represents hydrogen or lower alkyl having 1 to 4 carbon atoms, and
R_5 represents hydrogen, lower alkyl, phenyl or phenyl substituted with fluoro, chloro, lower alkyl having 1 to 4 carbon atoms or lower alkoxy having 1 to 4 carbon atoms with the proviso that when X is hydroxy, m is 3 or 4, or a pharmaceutically acceptable acid addition salt thereof.

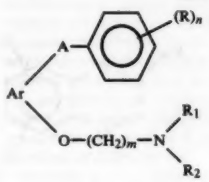
4,536,500

AROMATIC DERIVATIVES COMPRISING AN AMINOALKOXY CHAIN AND PHARMACEUTICAL COMPOSITIONS THEREOF

Guy R. Bourgery, Colombes; Alain P. Lacour, La Varenne; Bernard M. Pourrias, Meudon La Foret, and Raphaël Santamaria, Paris, all of France, assignors to Delalande S.A., France

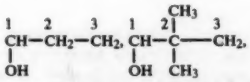
Filed Dec. 21, 1982, Ser. No. 451,537
Claims priority, application France, Dec. 24, 1981, 81 24244; Dec. 15, 1982, 82 21053
Int. Cl.³ C07D *295/08, 413/12;* **A61K** *31/445, 31/535*
U.S. Cl. 514—212 **6 Claims**

1. New aminoalkoxy aromatics, corresponding to the general formula:

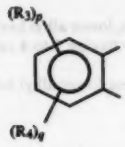


(I)

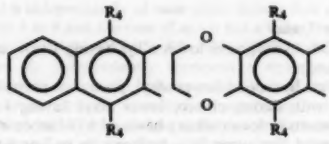
in which:
R represents hydroxyl;
n takes the value 1 or 2 when R is different from H;
m takes the value 2 or 3;
A represents a chain having any one of the following structures:



the aromatic group Ar being linked to position 1 of this chain,
R_1 and R_2 form in conjunction with the nitrogen atom to which they are linked a radical chosen from the following: pyrrolidino, piperidino, hexamathyleneimino, morpholino; and
Ar represents:
either a benzene group of structure:



in which R_3 represents a halogen atom or a nitro or methyl group, R_4=alkoxy with 1 to 4 carbon atoms, p=0, 1 or 2; q=1, 2, 3, 4; p+q≦4 or a naphthalene or benzodioxannic group respectively of structure:



where R_4 has the same meanings as previously, as well as their mineral or organic acid addition salts.

6. A pharmaceutical composition having an activity antagonistic to calcium comprising a therapeutically effective amount of a compound as claimed in claim 1 in combination with a pharmaceutically acceptable carrier.

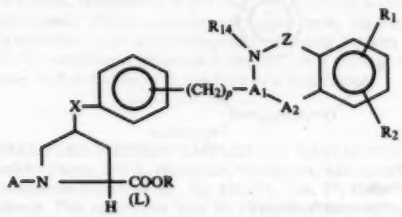
4,536,501

SUBSTITUTED 4-PHENOXY OR 4-PHENYLTHIO PROLINES

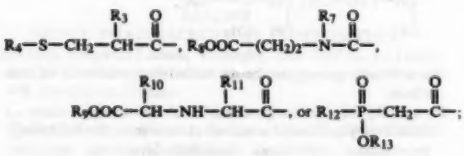
Joseph E. Sundeen, Yardley, Pa.; Rudiger D. Haugwitz, Titusville, and Peter W. Sprague, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 30, 1984, Ser. No. 595,219
Int. Cl.³ C07D *417/12*; A61K *31/54*
U.S. Cl. 514—225 **21 Claims**

1. A compound of the formula



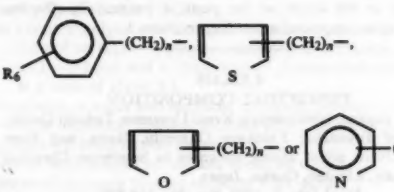
and a pharmaceutically acceptable salt thereof
wherein
X is oxygen or sulfur;
$-A_1-A_2-$ is $-CH-NH-$ or $-C=N-$;
A is



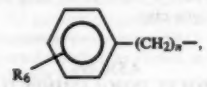
p is one, two, three or four;
R, R_8 and R_9 are independently selected from the group consisting of hydrogen, lower alkyl, benzyl, benzhydryl, and salt forming ion;
R_1 and R_2 are independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, halo substituted lower alkyl, nitro, and $-SO_2NH_2$;
Z is

R_3 is hydrogen, lower alkyl, halo substituted lower alkyl, phenyl, benzyl, phenethyl or cycloalkyl;
R_4 is hydrogen or

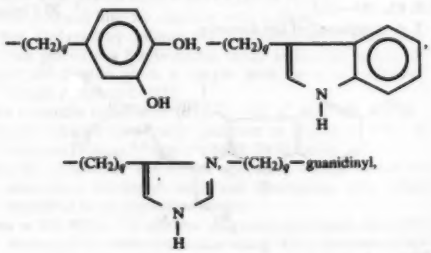
R_5 is lower alkyl,



n is zero, one, two, three or four;
R_6 is hydrogen, lower alkyl, lower alkoxy, halogen, or hydroxy;
R_7 is lower alkyl or cycloalkyl;
R_{10} is hydrogen, lower alkyl,



halo substituted lower alkyl, hydroxy substituted lower alkyl, $-(CH_2)_q$-cycloalkyl, $-(CH_2)_q$-N(lower alkyl)$_2$, $-(CH_2)_q-NH_2$, $-(CH_2)_q$-carboxy, $-(CH_2)_q-SH$, $-(CH_2)_q$-S-lower alkyl,



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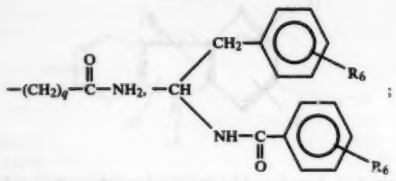
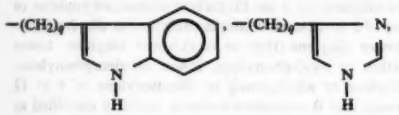
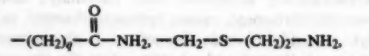
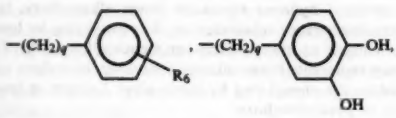


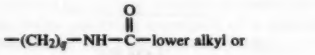
q is one, two, three or four;

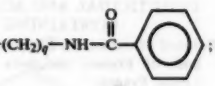
R_{11} is hydrogen, lower alkyl, halo substituted lower alkyl, hydroxy substituted lower alkyl, $-(CH_2)_q-NH_2$, $-(CH_2)_q-N(\text{lower alkyl})_2$, $-(CH_2)_q$-quanidinyl,



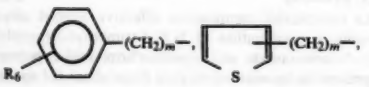


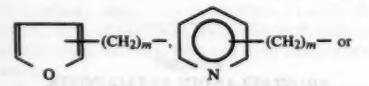






R_{12} is alkyl of 1 to 10 carbons,

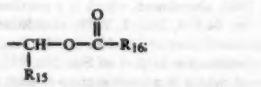




cycloalkyl—$(CH_2)_m$—;

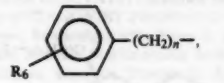
m is zero or an integer from 1 to 7;

R_{13} is hydrogen, lower alkyl, benzyl, benzhydryl, salt forming ion or



R_{15} is hydrogen, lower alkyl, cycloalkyl or phenyl; p0 R_{16} is hydrogen, lower alkyl, lower alkoxy, cycloalkyl, phenyl, benzyl, or phenethyl; and

R_{14} is hydrogen, lower alkyl, cycloalkyl-$(CH_2)_n$—,



halo substituted lower alkyl, hydroxy substituted lower alkyl, $-(CH_2)_q-N(\text{lower alkyl})_2$, or $-(CH_2)_q-NH_2$.

4,536,502

FUNGICIDAL 2-CYANOBENZIMIDAZOLE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE

Raymond Giraudon, Lesigny, and Georges Santini, Thiais, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

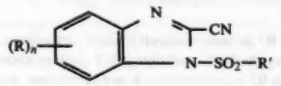
Filed Feb. 1, 1983, Ser. No. 463,055

Claims priority, application France, Feb. 9, 1982, 82 02281

Int. Cl.³ A01N *43/32, 43/52;* **C07D** *413/02, 235/04*

U.S. Cl. 514—227 **6 Claims**

1. A 2-cyanobenzimidazole derivative of the general formula:



in which

n represents an integer equal to 0, 1, 2 or 3;

R represents a halogen atom or a lower alkyl radical optionally substituted by one or more halogen atoms; a lower alkoxy radical optionally substituted by one or more halogen atoms or by the phenyl radical; a lower alkylthio radical optionally substituted by one or more halogen atoms; a lower alkenyl radical; a lower alkynyl radical; an amino radical optionally substituted by one or two identical or different lower alkyl radicals; a nitro radical; a cyano radical; a cyanato radical; a thiocyanato radical; an isothiocyanato radical; a lower alkylsulphonyl radical; a sulphamoyl radical optionally substituted by one or two identical or different lower alkyl radicals; a lower alkylsulphinyl radical; a lower alkanoyl radical optionally halogen substituted or a benzoyl radical optionally halogen substituted; or an alkoxycarbonyl radical containing from 2 to 5 carbon atoms, it being understood that if n is greater than or equal to 2, the substituents R can be either identical or different; and

R' represents a lower alkyl or cycloalkyl radical optionally substituted by one or more halogen atoms; an amino radical optionally substituted by one or two identical or different lower alkyl radicals which are themselves optionally substituted; or a morpholino radical, or pyrrolidino radical, it being understood that, in the above, the adjective "lower" applied to an organic radical means that this radical contains at most 6 carbon atoms.

4,536,503

NAPHTHOXYALKYLAMINES AND RELATED COMPOUNDS AS ANTIINFLAMMATORY AGENTS

Peter H. Nelson, Los Altos; Howard J. Ringold, Woodside; Stefan H. Unger, and Thomas R. Thieme, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

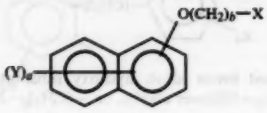
Division of Ser. No. 330,114, Dec. 14, 1981, abandoned. This application Jan. 9, 1984, Ser. No. 569,011

Int. Cl.³ A61K *31/40, 31/445, 31/495*

U.S. Cl. 514—255 **2 Claims**

1. A method for inhibiting, preventing, or reducing inflammation, which method comprises administering to a subject in

need of such treatment a therapeutically effective amount of a compound of the formula:



(I)

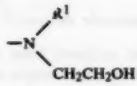
wherein;

Y is halo, alkoxy containing 1–8 carbon atoms, alkyl containing 1–8 carbon atoms, or dialkylamino in which each alkyl group contains 1–8 carbon atoms;

a is 0, 1 or 2;

b is an integer from 2–12 with the proviso that if b is 2 or 3 a cannot be 0; and

X is selected from the group consisting of: $-NH_2$, $-NHR^1$, NR_2^1, and



in which each R^1 is independently alkyl containing 1–8 carbon atoms, cycloalkyl containing 5–7 carbon atoms, or in $-NR_2^1$, both R^1 together form a or pyrrolidine, piperidine or piperazine ring, said piperazine ring being optionally substituted at the ring N by alkyl containing 1–8 carbon atoms, or $-CH_2CH_2OH$

or a pharmaceutically acceptable acid addition salt thereof.

4,536,504

HEXAHYDRODIOXOPYRIMIDINES, THEIR PRODUCTION AND USE

Tetsuya Okutani, Osaka, Japan, assignor to Takeda Chemical Industries, Ltd., Doshomachi, Japan

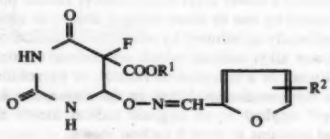
Filed Jul. 13, 1983, Ser. No. 513,339

Claims priority, application Japan, Jul. 13, 1982, 57-122535

Int. Cl.³ A61K *31/515;* C07D *239/20*

U.S. Cl. 514—270 **15 Claims**

15. A pharmaceutical composition for inhibiting the growth of tumorous cells which comprises an effective amount of a compound of the formula



wherein R^1 is lower alkyl; R^2 is hydrogen or lower alkyl and a pharmacologically acceptable carrier.

4,536,505

CERTAIN N-(PYRIDYL) INDOLES

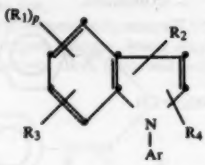
Leslie J. Browne, Morris Plains, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 17, 1983, Ser. No. 495,370

Int. Cl.³ A61K *31/44;* C07D *401/04*

U.S. Cl. 514—339 **17 Claims**

1. A compound of the formula



(I)

wherein Ar is 3- or 4-pyridyl or 3- or 4-pyridyl substituted by lower alkyl; R_1 is hydrogen, halogen, trifluoromethyl, lower alkyl, hydroxy, acylated or etherified hydroxy, lower alkyl-(thio, sulfinyl or sulfonyl), or two of R_1 on adjacent carbon atoms represent alkylenedioxy; p is 1 or 2; R_2 represents hydrogen or lower alkyl; one of R_3 and R_4 represents hydrogen and the other of R_3 and R_4 represents the group A–B in which A represents alkylene of 1 to 12 carbon atoms, alkynylene or alkenylene of 2 to 12 carbon atoms each, lower alkylene-phenylene, lower alkylene-(thio or oxy)-lower alkylene, lower alkylene-(thio or oxy)-phenylene, lower alkylenephenylene-lower (alkylene or alkenylene), or alkadienylene of 4 to 12 carbon atoms; and B represents carboxy, carboxy esterified as a pharmaceutically acceptable ester, carbamoyl, mono- or di-lower alkylcarbamoyl, cyano, hydroxycarbamoyl, or 5-tertrazolyl; a pyridyl-N-oxide thereof; or a pharmaceutically acceptable salt thereof; and wherein within the above definitions acylated hydroxy represents lower alkanoyloxy, benzoyloxy, benzoyloxy substituted on the phenyl ring by lower alkyl, halogen or lower alkoxy, or nicotinoyloxy; etherified hydroxy represents lower alkoxy, benzyloxy, benzyloxy substituted on the phenyl ring by lower alkyl, halogen or lower alkoxy, or pyridylmethoxy.

4,536,506

INSECTICIDAL AND ACARICIDAL COMBINATION CONTAINING A PYRETHROID

Bernard Marcoux, St. Etienne, and Jean-Noël Bridon, Trevous, both of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Nov. 22, 1982, Ser. No. 443,557

Claims priority, application France, Dec. 1, 1981, 81 22611

Int. Cl.³ A01N *43/40*

U.S. Cl. 514—342 **5 Claims**

1. An insecticidal composition effective against aleurodes comprising a combination of N,N,4-trimethyl-2-(pyrid-3-yl)-thiazole-5-carboxamide and cypermethrin, said cypermethrin being present in an amount ranging from about 0.1 to about 1 parts by weight per 100 parts by weight of said combination.

4,536,507

PROSTAGLANDIN ANTAGONISTS

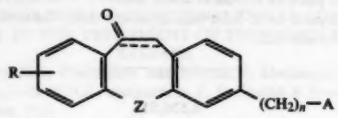
Joshua Rokach, Chomedy-Laval, Canada; Clarence S. Rooney, Worcester, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J. and Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 210,082, Nov. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 155,323, Jun. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 44,445, Jun. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 44,444, Jun. 1, 1979, abandoned, and a continuation-in-part of Ser. No. 917,212, Jun. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 819,199, Jul. 26, 1977, abandoned. This application Jul. 8, 1982, Ser. No. 396,452

Int. Cl.³ A61K *31/38;* C07D *337/14*

U.S. Cl. 514—362 **26 Claims**

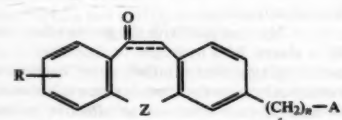
1. A compound of the formula:



wherein
n is 0;
Z is thio, sulfinyl, or sulfonyl;
R is hydrogen, halogen including chloro, bromo, fluoro and iodo, amino, C_1 to C_4 alkyl, C_1 to C_4 alkanoyl, hydroxyl, C_1 to C_4 alkoxy, thiol, C_1 to C_4 alkylthio, C_1 to C_4 alkylsulfinyl, C_1 to C_4 alkylsulfonyl, trifluoromethyl, trifluoromethylthio, cyano, carboxy, nitro and C_1 to C_4 alkyl or dialkylamino;
A is 5-tetrazolyl, 3-hydroxy-1,2,5-thiadiazol-4-yl, 4-hydroxy-Δ^3-pyrroline-3-yl-2,5-dione or

wherein R_2 is hydroxy, lower alkoxy, N,N-diloweralkylaminoloweralkoxy, hydroxyloweralkoxy, carboxyloweralkoxy, amino, N-loweralkylamino, N,N-diloweralkylamino, loweralkylsulfonylamino, carboxyloweralkylamino, carboxamidoloweralkylamino and 2-imino-3-methylthioazolidine; and the dotted line indicates either an olefinic bond or saturation at the 10,11-position; and the broken double bonds indicating that a 10-oxo substituent can be present when the 10,11-position is saturated.

26. A composition for treating undesirable contractile activity of prostaglandins consisting essentially of a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound of the formula



wherein
n is 0;
Z is thio, sulfinyl, or sulfonyl;
R is hydrogen, halogen including chloro, bromo, fluoro and iodo, amino C_1 to C_4 alkyl, C_1 to C_4 alkanoyl, hydroxyl, C_1 C_4 alkoxy, thiol, C_1 to C_4 alkylthio, C_1 to C_4 alkylsulfinyl, C_1 to C_4 alkylsulfinyl, trifluoromethyl, trifluoromethylthio, cyano, carboxy, nitro and C_1 to C_4 alkyl or dialkylamino;
A is 5-tetrazolyl, 3-hydroxy-1,2,5-thiadiazol-4-yl, 4-hydroxy-Δ^3-pyrroline-3-yl-2,5-dione or

wherein R_2 is hydroxy, lower alkoxy, N,N-diloweralkylaminoloweralkoxy, hydroxyloweralkoxy, carboxyloweralkoxy, amino, N-loweralkylamino, N,N-diloweralkylamino, loweralkylsulfonylamino, carboxyloweralkylamino, carboxamidoloweralkylamino and 2-imino-3-methylthiazolidine; and the dotted line indicates either an olefinic except (+) (7 or 8) fluorodibenzo[b,f]thiepin-3-carboxylic acid-5-oxides; bond or saturation at the 10-, 11-position; and the pharmaceutically acceptable salts thereof.

4,536,508

TRIAZOLEAMINE DERIVATIVES HAVING HISTAMINE H_2-ANTAGONIST PROPERTIES

John W. Clitherow, Sawbridgeworth; Barry J. Price, Hertford; John Bradshaw; Michael Martin-Smith, both of Ware; John W. M. Mackinnon, Royston; Duncan B. Judd, Ware, and Roger Hayes, Welwyn, all of England, assignors to Glaxo Group Limited, London, England

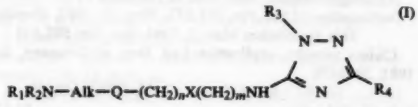
Continuation of Ser. No. 125,848, Feb. 29, 1980, abandoned. This application Feb. 18, 1983, Ser. No. 467,896

Claims priority, application United Kingdom, Mar. 2, 1979, 7907423

Int. Cl.[3] **A61K** *31/41*; **C07D** *249/14, 401/10, 413/10*

U.S. Cl. 514—383 **25 Claims**

1. Compounds of the general formula (I)



and physiologically acceptable salts, hydrates; and tautomers thereof, in which
R_1 and R_2, which may be the same or different, each represent hydrogen, C_{1-10} alkyl, C_{3-8} cycloalkyl, C_{3-6} alkenyl, aralkyl in which the alkyl moiety contains 1 to 6 carbon atoms; trifluoro C_{1-6} alkyl, or C_{1-6} alkyl substituted by hydroxy, C_{1-6} alkoxy, amino, C_{1-6} alkylamino or di C_{1-6} alkylamino or R_1 and R_2 may together with the nitrogen atom to which they are attached form a heterocyclic ring which is pyrrolidine, piperidine optionally substituted in the 4-position by C_{1-3} alkyl or hydroxy; tetrahydropyridine, morpholine, 2,6-di C_{1-6} alkylmorpholine, hexamethyleneimine or heptamethylenimine;
Alk represents a straight or branched alkylene chain of 1 to 6 carbon atoms;
Q represents a furan or thiophene ring in which incorporation into the rest of the molecule is through bonds at the 2- and 5-positions, the furan ring optionally bearing a further substituent R_6 adjacent to the group R_1R_2N—Alk—, or Q represents a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1- and 3- or 1- and 4-positions;
R_6 represents halogen or C_{1-4} alkyl which may be substituted by hydroxy or C_{1-4} alkoxy;
X represents —CH_2—, —O—, —S— or

where R_5 represents hydrogen or methyl;
n represents zero, 1 or 2;
m represents 2, 3 or 4;
R_3 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, ar C_{1-6} alkyl, hydroxy C_{2-6} alkyl, C_{1-6} alkoxy C_{1-6} alkyl or phenyl optionally substituted by one or more C_{1-3} alkyl or alkoxy groups or halogen atoms; and
R_4 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, phenyl optionally substituted by one or more C_{1-3} alkyl or alkoxy groups or halogen atoms; aralkyl in which the alkyl moiety contains 1 to 6 carbon atoms; hydroxy C_{1-6} alkyl, acyloxy C_{1-6} alkyl in which the acyl portion is C_{1-6} alkanoyl, benzoyl optionally substituted by 1 or more C_{1-3} alkyl or alkoxy groups or halogen atoms, or aralkanoyl in which the alkyl moiety contains 1 to 6 carbon atoms; C_{1-6} alkoxy C_{1-6} alkyl, aryloxy C_{1-6} alkyl, ar C_{1-6} alkyloxy C_{1-6} alkyl; amino C_{1-6} alkyl, C_{1-6} alkyl-amino C_{1-6} alkyl, di C_{1-6} alkylamino C_{1-6} alkyl, hydroxy, C_{1-6} alkoxy, C_{1-6} alkythio or halogen and wherein aryl or as a group or part of a group is phenyl

optionally substituted by one or more C_{1-3} alkyl or alkoxy groups or halogen atoms.

22. A pharmaceutical composition comprising an effective amount of a compound for the treatment of conditions mediated through H_2 receptors wherein said compound is as claimed in any of claims 1, 2, 15, 16 or 17 together with at least one pharmaceutically acceptable carrier or diluent, and optionally one or more further active ingredients.

4,536,509

1,1-DIARYL-2-AZOLYLETHANES AND PREPARATIONS CONTAINING THESE COMPOUNDS

Ulrich Hertenstein, Leitershofen; Hilmar Mildenberger, Kelkheim; Burkhard Sachse, Kelkheim, and Peter Hartz, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

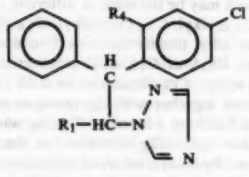
Continuation of Ser. No. 381,837, May 25, 1982, abandoned. This application Mar. 7, 1984, Ser. No. 585,621

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1981, 3121676

Int. Cl.³ A01N *43/64, 43/50;* C07D *249/08*

U.S. Cl. 514—383 **11 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or methyl, and R_4 is hydrogen or a chlorine atom.

10. A method of combatting fungi damaging crop plants which comprises treating the plants or the infected area thereof with a compound of claim 1.

4,536,510

METHOD OF ANTAGONIZING THE EFFECTS OF THROMBOXANE

Martin A. Wasserman, Ambler, Pa., and Barry M. Weichman, Voorhees, N.J., assignors to Smith Kline Beckman Corporation, Philadelphia, Pa.

Filed Jul. 22, 1983, Ser. No. 516,221

Int. Cl.³ A61K *31/47*

U.S. Cl. 514—308 **8 Claims**

1. A method of antagonizing the effects of thromboxane A_2 in the circulatory system of an animal which comprises administering to an animal in need of said antagonism a nontoxic effective amount of the active ingredient, N,N'-bis[7-(3-chlorobenzeneaminosulfonyl)-1,2,3,4-tetrahydroisoquinolyl]-disulfonylimide or a pharmaceutically acceptable salt thereof.

4,536,511

MEDICAMENTS CONTAINING MUZOLIMINE, THEIR USE AND PROCESSES FOR THEIR PRODUCTION

Wolfgang Fischer, Bergisch-Gladbach, and Felix Leiblein, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,447

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306366

Int. Cl.³ A61K *31/415*

U.S. Cl. 514—404 **8 Claims**

1. A muzolimine-containing composition in the form of a compressed tablet and comprising by weight about

(a) 100 parts of muzolimine

(b) 40–500 parts of starch

(c) 20–100 parts of microcrystalline cellulose

(d) 0.2–5 parts of colloidal silica, and

(e) 0.1–3 parts of at least one of stearic acid, Ca stearate, Mg stearate and talc.

4,536,512

5-(2,3-DIHYDRO-1H-PYRROLIZIN-5-OYL)-2,3-DIHYDRO-1H-PYRROLIZINE-1-ALKANOIC OR CARBOXYLIC ACIDS AND USE THEREOF AS ANTI-INFLAMMATORY AND ANALGESIC AGENTS

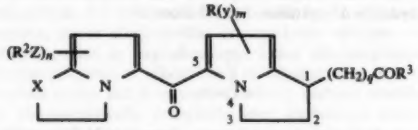
Tesfaye Biftu; Bruce E. Witzel, and Peter L. Barker, all of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 8, 1982, Ser. No. 433,339

Int. Cl.³ A61K *31/40;* C07D *487/06*

U.S. Cl. 514—413 **7 Claims**

1. A compound of formula



(I)

or a pharmaceutically acceptable salt thereof wherein:

R is

(a) H or C_{1-6} alkyl;

(b) C_{2-4} alkenyl;

(c) halo-C_{1-6} alkyl; or

(d) phenyl-C_{1-3} alkyl;

m is 0 or 1;

R^2Z can be at any available position and R^2 is R;

q is 0 to 2;

n is 0 to 1;

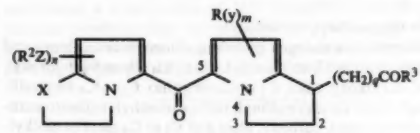
R^3 is hydroxy, C_{1-6} alkoxy or C_{1-6} (alkanoylaminoalkoxy);

X is $—CHR^4—$;

Y is —O—, —S—, Ch_2— or H with the proviso that when Y is H, R is absent; and

Z is —S—, $—CH_2—$ or halo with the proviso that when Z is halo, R^2 is absent, R^4 is hydrogen or C_{1-6} alkyl.

6. A method of treatment of inflammatory conditions, fever and pain which comprises the administration to a mammmalian species in need of such treatment an effective amount of a compound of formula



(I)

or a pharmaceutically acceptable salt thereof wherein:

R is

(a) H or C_{1-6} alkyl;

(b) C_{2-4} alkenyl;

(c) halo-C_{1-6} alkyl; or

(d) phenyl-C_{1-3} alkyl;

m is 0 or 1;

R^2Z can be at any available position and R^2 is R;

q is 0 to 2;

n is 0 to 1;

R^3 is hydroxy, C_{1-6} alkoxy or C_{1-6} (alkanoylaminoalkoxy);

X is $—CHR^4—$;

Y is —O—, —S—, CH_2— or H with the proviso that when Y is H, R is absent; and

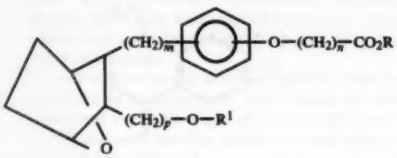
Z is —S—, $—CH_2—$ or halo with the proviso that when Z is halo, R^2 is absent, R^4 is hydrogen or C_{1-6} alkyl.

4,536,513
7-OXABICYCLOHEPTANE SUBSTITUTED PROSTAGLANDIN INTERPHENYLENE ANALOGS USEFUL IN THE TREATMENT OF THROMBOLYTIC DISEASE

Jagabandhu Das, Plainsboro, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 14, 1984, Ser. No. 589,384
Int. Cl.³ A61K *31/34, 31/557;* **C07D** *307/00*
U.S. Cl. 514—469 **11 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof;
wherein m is 1 to 4; n is 1 to 8; p is 1 to 4; R is H, lower alkyl or alkali metal; and R^1 is lower alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl or lower alkenyl, wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;
the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with 1 or 2 lower alkyl groups 1 or 2 halogen groups and/or 1 or 2 lower alkoxy groups;
the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups;
the term lower alkenyl by itself or as part of another group contains 2 to 12 carbons;
the terms $(CH_2)_m$ and $(CH_2)_p$ include 1 to 4 carbons in the normal chain and the term $(CH_2)_n$ includes 1 to 8 carbons in the normal chain;
and the terms $(CH_2)_m$ $(CH_2)_n$ and $(CH_2)_p$ may be unsubstituted or include one or more lower alkyl substituents.

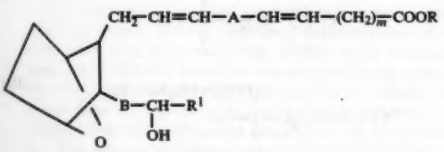
7. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,536,514
7-OXABICYCLOHEPTANE SUBSTITUTED PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOLYTIC DISEASE

Jagabandhu Das, Plainsboro, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 6, 1984, Ser. No. 597,324
Int. Cl.³ A61K *31/34, 31/557;* **C07D** *307/00*
U.S. Cl. 514—469 **12 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof;
wherein
A is a single bond or $—CH_2—$; m is 0 when A is $—CH_2—$ and m is 1 when A is a single bond; B is —CH=CH— or $(CH_2)_2$; R is H, lower alkyl or alkali metal; and R^1 is lower alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl or lower alkenyl, wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;
the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens and/or 1 or 2 lower alkoxy groups;
the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups; and
the term lower alkenyl by itself or as part of another group contains 2 to 12 carbons.

8. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

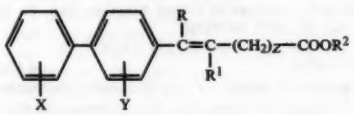
4,536,515
SUBSTITUTED PHENYLALKENOIC ACIDS AND ESTERS

Patrice C. Belanger, Dollard des Ormeaux, and John W. Gillard, Pointe Claire, both of Canada, assignors to Merck Frosst Canada, Inc., Quebec, Canada

Filed Dec. 6, 1982, Ser. No. 446,908
Int. Cl.³ C07L *69/76;* **A01N** *37/00*
U.S. Cl. 514—532 **11 Claims**

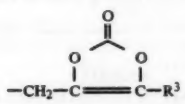
1. A pharmaceutical composition useful for treating asthma, or treating or inhibiting blood platelet aggregation in humans containing an effective amount of a compound having the formula

I



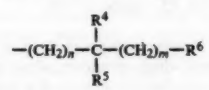
wherein
R is H or C_1–C_4 alkyl, C_1–C_4 alkoxy or hydroxy,
R^1 is H or C_1–C_4 alkyl, C_1–C_4 alkoxy or hydroxy,
R^2 is
(i) hydrogen,
(ii) C_1–C_6 alkyl,
(iii)

II



wherein
R^3 is C_1–C_6 alkyl or aryl or
(iv)

III



wherein

n is 0, 1, 2, or 3;

m is 0, 1, 2, or 3;

R^4 and R^5 are individually H or alkyl of 1 to 3 carbon atoms and;

R^6 is selected from the group consisting of

(A) a monocyclic or bicyclic heterocyclic radical containing from 3 to 12 nuclear carbon atoms and 1 or 2 nuclear hetero atoms selected from N and S with at least one being N, and with each ring in the said heterocyclic radical containing 5 to 6 members and

(B) the radical X^1—R^7 wherein X^1 is —O—, —S—, or —NH— and R^7 contains up to 21 carbon atoms and is (1) hydrocarbon radical or (2) an acyl radical of an organic acyclic or monocyclic carboxylic acid containing not more than 1 hetero atom in the ring,

Y is H, halo, hydroxy, C_1–C_4 alkoxy or azide,

X is H, halo, hydroxy, C_1–C_4 alkoxy or azide, and

Z is 3, 5, or 7,

and pharmaceutically acceptable salts thereof.

4,536,516

ALKENE DERIVATIVES

Michael J. K. Harper, Ferney-Voltaire, France; Dora N. Richardson, and Arthur L. Walpole, deceased, both of Macclesfield, England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 486,913, Jul. 9, 1974, abandoned, and a continuation of Ser. No. 359,297, Mar. 18, 1982, abandoned, which is a continuation of Ser. No. 918,267, Jun. 22, 1978, abandoned, which is a continuation of Ser. No. 486,774, Jul. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 262,939, Jun. 15, 1972, abandoned, which is a continuation of Ser. No. 868,667, Oct. 13, 1969, abandoned, which is a continuation of Ser. No. 632,536, Apr. 21, 1967, abandoned, which is a continuation-in-part of Ser. No. 532,891, Mar. 9, 1966, abandoned, and Ser. No. 304,652, Aug. 26, 1973, abandoned, said Ser. No. 486,913, is a continuation-in-part of Ser. No. 262,939, .. This application Apr. 17, 1984, Ser. No. 600,224

Claims priority, application United Kingdom, Sep. 13, 196.., 34989/62; Jul. 20, 1965, 30755/65

Int. Cl.³ A61K *31/135, 31/205*

U.S. Cl. 514—514 **6 Claims**

1. The geometric isomer of 1-(p-β-dimethylaminoethoxyphenyl)-1,2-diphenylbut-1ene, and the pharmaceutically acceptable, acid addition salts thereof, which is identified by its citrate having a melting point of 140°–142° C.

4. In a process for the treatment of hormone dependent tumors, the improvement which comprises treating said tumors with an effective amount of a member of the group consisting of the geometric isomer of 1-(p-β-dimethylaminoethoxyphenyl)-1,2-diphenylbut-1-ene, and the pharmaceutically acceptable, acid addition salts thereof, which isomer is identified by its citrate having a melting point of 140°–142° C.

4,536,517

METHOD OF TREATING DIABETES MELLITUS USING ARYLGLYOXALS

Middleton B. Floyd, Jr., Suffern, and Jo A. Goidl, Spring Valley, both of N.Y., assignors to American Cyanamid Company, Me.

Filed Apr. 25, 1983, Ser. No. 488,237

Int. Cl.³ A61K *31/185*

U.S. Cl. 514—576 **2 Claims**

1. The method of treating diabetes mellitus in a mammal in need of such treatment which comprises administering to said mammal an effective antidiabetic amount of α-hydroxy-β-oxo-3-biphenylethanesulfonic acid, sodium salt.

4,536,518

ANTIDEPRESSANT DERIVATIVES OF CIS-4-PHENYL-1,2,3,4-TETRAHYDRO-1-NAPHTHALENAMINE

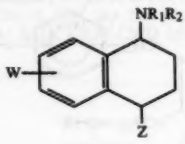
Willard M. Welch, Jr., Mystic; Charles A. Harbert, Waterford; B. Kenneth Koe, Gales Ferry, and Allen R. Kraska, East Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 1, 1979, Ser. No. 90,240

Int. Cl.³ A01N *33/02;* **C07C** *87/64*

U.S. Cl. 514—647 **22 Claims**

1. A compound selected from the group consisting of cis-isomeric bases of the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein

R_1 is selected from the group consisting of hydrogen and methyl,

R_2 is methyl,

Z is selected from the group consisting of 3-chlorophenyl, 4-chlorophenyl, 4-methoxyphenyl, 3-trifluoromethyl-phenyl, 4-trifluoromethyl-phenyl, 3,4-dichlorophenyl, 3-bromophenyl, 4-bromophenyl and 3-trifluoromethyl-4-chloro-phenyl, and

W is selected from the group consisting of hydrogen, fluoro, chloro, bromo, trifluoromethyl and alkoxy of from 1 to 3 carbon atoms,

with said compound being either the (1S)-enantiomer or the racemic mixture of the (1S)-enantiomer with the corresponding (1R)-enantiomer.

19. A method for combatting mental depression in a mentally-depressed subject which comprises administering to said subject an effective amount of a compound of claim 1.

4,536,519

EMULSIFYING AGENT AND EMULSIFIED COSMETICS

Toshiyuki Suzuki, Sakura; Tohru Nakamura, Funabashi, and Hisao Tsutsumi, Miyashiro, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,521

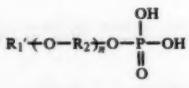
Claims priority, application Japan, Jun. 15, 1981, 56-92007; Jul. 9, 1981, 56-107339

Int. Cl.³ A61K *31/66, 47/00*

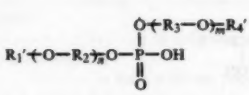
U.S. Cl. 514—785 **10 Claims**

1. An emulsified cosmetic, consisting essentially of the following components (a) to (d):

(a) 0.1 to 5 wt% of a neutralized product of a phosphoric acid ester which is neutralized with 0.2 to 1.8 times on a molar basis of a basic substance selected from the group consisting of an alkali metal hydroxide, a basic amino acid and an alkanolamine, said phosphoric acid ester containing a phosphoric acid monoester represented by formula (Ia) and a phosphoric acid diester represented by formula (IIa) in a molar ratio ranging from 100:0 to 70:30:



(Ia)



(IIa)

wherein R_1' and R_4' each represent a linear alkyl group or a linear alkenyl group of 10 to 22 carbon atoms, R_2 and R_3 each represent an ethylene group or a propylene group and m and n are each a number of 0 to 30;

(b) 0.1 to 20 times by weight the amount of component (a) of a nonionic surfactant with an HLB value of up to 6, said nonionic surfactant being selected from the group consisting of polyoxyalkylene alkyl ether, polyoxyalkylene alkenyl ether, polyoxyalkylene alkylphenyl ether, polyoxyalkylene fatty acid ester, polyoxyalkylene glycerin fatty acid ester, polyoxyalkylene sorbitan fatty acid ester, polyoxyalkylene hardened castor oil, polyoxyalkylene alkyl amide, glycerin fatty acid ester, sorbitan fatty acid ester, sucrose fatty acid ester, polyglycerin fatty acid ester, ethylene or propylene glycol fatty acid ester, and fatty acid alkanolamide;

(c) 1 to 60 wt% of an oily substrate selected from the group consisting of hydrocarbons, wax, natural oil and fat of animal and vegetable origin, silicone oil, fatty acid, higher alchol, and ester reaction products of said higher alcohol and said fatty acid; and

(d) 25 to 95 wt% of water.

4,536,520

POLYPHOSPHAZENE FOAM PROCESS

Warren B. Mueller, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 11, 1984, Ser. No. 619,51[illegible]

Int. Cl.[3] C08J *9/10*

U.S. Cl. 521—89 **23 Claims**

1. A process for making a polyphosphazene foam having consistent appearance and physical properties, said process comprising:

(A) forming a composition comprising a substantially linear high molecular weight polyphosphazene gum, a curing agent, a blowing agent and optionally a plasticizer, an inorganic filler, an accelerator and processing aids,

(B) masticating said composition to form a substantially homogenous blend while measuring the temperature of said composition undergoing mastication and continuing said masticating until said temperature rises to a pre-determined level up to about 71° C. and then stopping said masticating,

(C) forming the resultant masticated composition into a shaped composition and

(D) heating said shaped composition in an unconfined environment to a temperature which activates said blowing agent causing said shaped composition to expand into a foamed composition and completes curing of said foamed composition.

4,536,521

POROUS CROSS-LINKED ABSORBENT POLYMERIC MATERIALS

Zia Haq, Merseyside, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Sep. 7, 1983, Ser. No. 530,167

Claims priority, application United Kingdom, Sep. 7, 1982, 8225415

Int. Cl.[3] C08J *9/28*

U.S. Cl. 521—146 **7 Claims**

1. A sulphonated, porous, cross-linked polymeric material prepared from a process comprising polymerization of vinyl monomers in a water-in-oil high internal phase emulsion, at least about 90% by weight of the emulsion being water, the resultant polymeric structure having a pore volume in the range from 8 cc/g up to 99.5 cc/g, which polymer is then sulphonated, the sulphonated material having an absorbency for 10% aqueous chloride of at least 3 g/g of dry sulphonated material or salt thereof.

4,536,522

MANUFACTURE OF POLYOLS AND RIGID POLYURETHANE FOAM USING THIODIALKYLENE GLYCOLS

Robert A. Grigsby, Jr., Georgetown; George P. Speranza, Austin; Michael E. Brennan, Austin, and Ernest L. Yeakey, Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 18, 1984, Ser. No. 632,167

Int. Cl.[3] C08G *18/14, 18/42;* C09K *3/00*

U.S. Cl. 521—172 **21 Claims**

1. A process for the preparation of a polyol which comprises the steps of digesting a polyalkylene terephthalate with from about 0.8 to about 2 molecular equivalents, based on the alkylene terephthalate groups in the polyalkylene terephthalate, of a polyol having a molecular weight of about 500 or less at a temperature within the range of about 190° to about 280° C. and a pressure within the range of about 1 to about 40 atmospheres for a period of time within the range of about 0.5 to 5 hours while removing from the reaction product volatile condensation by-products including ethylene glycol and derivatives thereof until at least about 10 wt. % of the charge has been removed overhead, cooling the reaction mixture to a temperature within the range of about 150°–190° C., adding from about 10 to about 90 mole percent, based on the low molecular weight diol, of a thiodialkylene glycol and thereafter maintaining said reaction mixture within said temperature range for a period of time within the range of about 0.5 to about 5 hours to thereby provide a thiodialkylene glycol modified polyester polyol condensation product.

9. A process for the preparation of a rigid polyurethane foam which comprises reacting an excess of an aromatic polyisocyanate with a polyol component in the presence of a blowing agent, a catalyst, and a foam stabilizing agent,

said polyol component comprising a thiodialkylene glycol modified polyester polyol condensation product of a polyalkylene terephthalate with a polyol having a molecular weight of about 500 or less, said condensation product having been prepared by digesting a polyalkylene terephthalate with from about 0.8 to about 2 molecular equivalents, based on the ethylene terephthalate groups in the polyethylene terephthalate, of a polyol having a molecular weight of about 500 or less at a temperature within the range of about 190° to about 280° C. and a pressure within the range of about 1 to about 40 atmospheres for a period of time within the range of about 0.5 to 5 hours while removing from the reaction product volatile condensation by-products including ethylene glycol and derivatives thereof until at least about 10 wt. % of the charge has been removed overhead, cooling the reaction mixture to a temperature within the range of about 150°–190° C., adding from about 20 to about 50 mole percent, based on the low molecular weight diol, of a thiodialkylene glycol and thereafter maintaining said reaction mixture within said temperature range for a period of time within the range of about 0.5 to about 5 hours to thereby provide said thiodialkylene glycol modified polyester polyol condensation product.

4,536,523

DENTAL COMPOSITE FORMULATION FROM ACRYLATE MONOMER AND POLYTHIOL ACCELERATOR

Joseph M. Antonucci, Kensington, Md., assignor to The United States of America as represented by the Secretary of the Department of Health & Human Services, Washington, D.C.

Filed Dec. 23, 1983, Ser. No. 565,212

Int. Cl.[3] C08L *33/08*

U.S. Cl. 523—115 **10 Claims**

1. The reaction product of admixing two pastes of a two paste dental composite formulation, said formulation comprising: an initiator paste and an accelerator paste; said initiator paste including a first polymerizable acrylate monomer and an organic hydroperoxide initiator having a 10-hour half-life temperature in excess of about 100° C.; said accelerator paste including a second polymerizable acrylate monomer, which is

the same or different from said first polymerizable acrylate monomer, and an accelerating amount of polythiol accelerator, selected from the group consisting of pentaerythritol tetra-(3-mercaptopropionate); pentaerythritol tetra(thioglycolate); trimethylolethane tris-(3-mercaptopropionate); trimethylolpropane tris-(3-mercaptopropionate); dipentaerythritol hexa-(3-mercaptopropionate); dipentaerythritol hexa(thioglycolate); polyethyleneglycol- and polypropylene glycol di-(3-mercaptopropionate); oligomeric multi-functional mercaptans containing terminal and grafted thiol groups, polymeric multi-functional mercaptans containing terminal and grafted thiol groups; polyesters of 3-mercaptopropionic acid; glycol dimercaptopropionate; said formulation being polymerizable at ambient temperatures upon admixture of said initiator paste and said accelerator paste.

4,536,524

MICROENCAPSULATED EPOXY ADHESIVE SYSTEM

Ronald L. Hart, Xenia; Dale E. Work, London, both of Ohio, and Colin E. Davis, Portage, Mich., assignors to Capsulated Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 256,219, Apr. 21, 1981, abandoned. This application Jun. 15, 1982, Ser. No. 388,564

Int. Cl.³ C09J *3/14, 3/16*

U.S. Cl. 523—176 **1 Claim**

1. An aqueous based epoxy adhesive system, comprising:

a coacervate of polyvinyl alcohol; a solution of methylene dianiline; and microcapsules containing an epoxy resin; said polyvinyl alcohol coacervate comprising a continuous phase in which said methylene dianiline solution and said epoxy microcapsules are dispersed.

4,536,525

AQUEOUS COATING COMPOSITION BASED ON A CATIONIC AMINO UREA RESIN, PROCESS FOR APPLYING AND BAKING THE COMPOSITION AND THE COATED SUBSTRATE THUS OBTAINED

Karl-Heinz Freese, Stuttgart, and Hans-Jürgen Münch, Sachsenheim, both of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Jul. 11, 1984, Ser. No. 629,574

Claims priority, application Netherlands, Jul. 18, 1983, 8302557

Int. Cl.³ C08L *63/00, 67/00*

U.S. Cl. 523—414 **21 Claims**

1. An aqueous coating composition based on a cationic amino urea resin having an amine number of 3–250 and obtained by reacting

(A) an organic isocyanate having 1–4 isocyanate groups and 2–48 carbon atoms with

(B) a polyamino amide having an amine number of 40–500 built up from

1. at least one of a mono- and dicarboxylic acid having 2–40 carbon atoms and

2. a polyamine having 2–8 amino groups selected from primary and secondary amino groups and 2–20 carbon atoms,

and neutralization of at least part of the amino groups, characterized in that the coating composition also contains 5–1000 parts by weight (calculated on 100 parts by weight of the cationic binder as solid matter) of at least one solid compound selected from a solid epoxy group-containing compound having a number average molecular weight of at least 900 and an epoxy equivalent weight in the range of from 450 to 7500 and a solid polyester compound, the solid compound having a melting point of at least 40° C. and an average particle size in the range of from 0,5, to 35 μm .

4,536,526

METHOD OF MANUFACTURING POLYESTER FIBERS WITH GOOD ADHESION TO RUBBER

Shigemitsu Murase, Joyo, Japan, assignor to Unitika Ltd., Osaka, Japan

Filed Nov. 2, 1981, Ser. No. 317,667

Claims priority, application Japan, Nov. 26, 1980, 55-167173

Int. Cl.³ C08G *59/06*

U.S. Cl. 523—433 **16 Claims**

1. A finish composition for polyester fiber to improve adhesion to rubber comprising

(a) about 20 to 70 weight percent of a lubricant which comprises at least 80 weight percent of an ester of thiodicarboxylic acid,

(b) about 5 to 40 weight percent of an epoxy compound, and

(c) about 10 to 50 weight percent of a surfactant.

4,536,527

POLY(BUTYLENE TEREPHTHALATE) BASED MOLDING RESINS

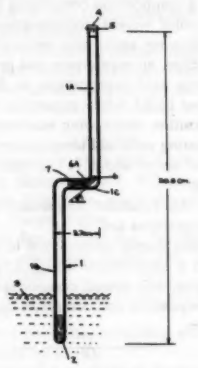
Wilfred L. Shearer, Mountainside; Stephen M. Sinker, Lebanon, and Richard A. Wolf, Plainfield, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 493,455, May 11, 1983, Pat. No. 4,469,834. This application May 7, 1984, Ser. No. 607,833

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.³ C08K *5/13, 5/24;* C08L *67/02*

U.S. Cl. 524—193 **11 Claims**



1. A flame retardant molding resin capable of being molded into an article exhibiting reduced tendency to corrode a copper surface when the molded resin and the copper surface are placed in spaced relationship in a common unventilated atmosphere at elevated temperatures, as measured by the Bell Telephone Laboratories Copper Corrosion Test at temperatures within the range of from 150° to 175° C., wherein the molding resin comprises the combination of (a) a butylene terephthalate polyester comprising a brominated copolyester as a polymeric flame retardant comprising aromatic halogen groups in a flame retardant amount, and (b) an alkylhydroxyphenylalkanoylhydrazine in an amount that is within the range of from 0.05 to 0.3% by weight, based on the weight of the molding resin, and wherein the molding resin does not contain any phenolic antioxidant that is free of nitrogen and the molding resin has a life of at least 60 hours at 175° C. as measured by the Bell Test based on 3 samples.

4,536,528

STABLE MINERAL SPIRIT DISPERSIONS OF CARBOXYL-CONTAINING POLYMERS

Thomas R. George, Jr., Wooster, and Robert Y. Lochhead, Jr., Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 9, 1984, Ser. No. 629,040
Int. Cl.[3] C08K 5/10; C08L 33/02, 53/00
U.S. Cl. 524—313 15 Claims

1. Stable slurries of polymers of olefinically unsaturated carboxylic acids containing at least one activated carbon-to-carbon olefinic double bond and at least one carboxyl group in mineral spirits in concentrations from about 15 to 70 weight percent polymer containing stabilizing amounts of at least one block copolymer and at least one glyceryl tris-12-hydroxystearate and/or mixed saturated C_{18}–C_{36} fatty acid triglycerides, said block copolymer is selected from block copolymers of propylene oxide and ethylene oxide having molecular weight in the range of about 1,000 to 20,000 and containing about 10 to 80% by weight of polyoxyethylene units.

4,536,529

FLAME RETARDANT THERMOPLASTIC COMPOSITIONS

Robert B. Frye, Albany, N.Y., and Michio Zembayashi, Ohta, Japan, assignors to General Electric Company, Waterford, N.Y.

Filed Dec. 20, 1983, Ser. No. 563,354
Int. Cl.[3] C08K 5/09; C08L 23/06, 23/12, 25/06
U.S. Cl. 524—284 20 Claims

1. A flame retardant composition comprising:
(A) 30% to 98% by weight of thermoplastic;
(B) 1% to 40% by weight of a silicone fluid comprised of RR'SiO units, where R and R' represent, independently, substituted or unsubstituted monovalent organic radicals of 1 to 20 carbon atoms, and having a viscosity of about 600 to 300,000,000 cps at 25° C.;
(C) 1% to 20% by weight of metal soap precursors comprising:
(i) 50% to 100% by weight of a carboxylic acid or related carboxylic compound containing at least 6 carbon atoms, and
(ii) 0% to 50% of a reactive Group IIA metal compound,
(D) 1% to 20% of a silicone resin.

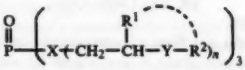
4,536,530

WATER TREE RESISTANT COMPOUNDS AND POLYMER COMPOSITIONS CONTAINING THE SAME

Anthony Barlow, and Melvin F. Maringer, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,974
Int. Cl.[3] C08K 5/51, 5/52
U.S. Cl. 524—109 20 Claims

1. A polymeric composition having enhanced resistance to water treeing and being devoid of anti-tracking additive and inorganic peroxide and comprising an intimate admixture of:
a polymeric component and
an effective water treeing inhibiting amount of about 0.1 to 5% by weight, based on the weight of said polymeric component, of, as the sole antitreeing agent, a compound having the general formula:



wherein X is selected from the group consisting of O, S, N and NR^3, Y is selected from the group consisting of O, S, and NR^3, R^1 and R^2 are independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl, and phenyl, R^3 is hydrogen or alkyl of from 1 to 6 carbon atoms and wherein R^1 and R^2 may be taken with the carbon atom and Y substituent to which they are respectively bonded to form a ring, and
with a first proviso that when X is O, S or NR_3, n is 1, and when X is N, n is 2, and
with a second proviso that said polymeric component is other than a polyurethane, and
with a third proviso that said composition contains about 20 to 30% by weight of filler when said polymeric component is ethylene-propylene rubber or ethylene-propylene-diene monomer copolymer and said composition contains 0 to less than 10% by weight of filler when said polymeric component is other than said rubber or said copolymer.

4,536,531

POLYESTER RESIN COMPOSITION

Yoshinari Ogawa, and Noriyuki Akagi, both of Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 343,456, Jan. 28, 1982, abandoned. This application May 19, 1983, Ser. No. 496,059
Claims priority, application Japan, Jan. 30, 1981, 56-11549; May 8, 1981, 56-68106; Jul. 17, 1981, 56-110804
Int. Cl.[3] C08L 67/02, 67/04
U.S. Cl. 524—135 9 Claims

1. A polyethylene terephthalate resin composition comprising:
(A) per 100 parts by weight of said polyethylene terephthalate resin, 0.1 to 30 parts by weight of a polycaprolactone having a number average molecular weight of from 200 to 2000 and 50% or more of its entire number of terminal radicals modified to be non-reactive and
wherein said polyethylene terephthalate resin has an intrinsic viscosity of from 0.35 or more determined in orthochlorophenol at a temperature of 35° C.;
(B) 0.01 to 10 parts by weight of a crystal nucleating agent for said polyethylene terephthalate resin, per 100 parts by weight of said resin; and
(C) 5 to 200 parts by weight of an inorganic filler, per 100 parts by weight of said polyethylene terephthalate resin.

4,536,532

PLASTICIZED POLYVINYL ALCOHOL COMPOSITIONS, FORMING PROCESS AND FORMED ARTICLES

Gerald W. Miller, P.O. Box 30041, Cincinnati, Ohio 45230, and H. Harald Lutzmann, 2241 Briarwood Rd., Cleveland, Ohio 44118

Continuation-in-part of Ser. No. 382,481, May 27, 1982, abandoned. This application Jan. 9, 1984, Ser. No. 568,940
Int. Cl.[3] C08K 5/52
U.S. Cl. 524—141 12 Claims

1. A process for the manufacture of a formed article of polyvinyl alcohol, said article having an oxygen permeability no greater than about 1 cc. mil/100 in.^{2} day atm. at 25° C. and 80% relative humidity, consisting essentially of:
1. mixing
a. A polyvinyl alcohol homopolymer having a vinyl alcohol content in excess of 95%; or
b. a blend of (a) with a polyvinyl alcohol/C_{2-4} olefin copolymer wherein (a) is at least 25% by weight of the mixture and the olefin moiety in the copolymer is not more than about 45% by weight of the copolymer; with
c. a plasticizer selected from the group consisting of N-substituted C fatty acid amides; aryl, alkaryl, N-aryl aryl, N-alkaryl aryl and N-alkyl alkaryl sulfonamides and alkaryl sulfonamides; N-alkyl pyrrolidones; sulfonated alkyl phenols; aryl and alkaryl phosphates and phosphites; alkylene carbonates and selected mixtures thereof;
2. removing the water from the mixture so that it is essentially anhydrous and forming the dry mixture into an article;

3. heating the article to a temperature of at least about 200° C., either concurrently with or after the forming step 2; and
4. slowly cooling the resulting article.

4,536,533

PRODUCT

Augustin T. Chen; David J. Goldwasser, both of Cheshire, and Kemal Onder, North Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 558,148, Dec. 5, 1983, Pat. No. 4,501,844. This application Dec. 10, 1984, Ser. No. 680,039

Int. Cl.³ C08L 77/00; C08K 5/04

U.S. Cl. 524—161 **14 Claims**

1. A composition comprising a blend of,

A. a linear polyamide selected from the group consisting of poly(4,4'-methylenediphenylene azelamide), poly(4,4'-methylenediphenylene sebacamide), poly(4,4'-methylenediphenylene undecanediamide), poly(4,4'-methylenediphenylene dodecanediamide), and mixtures thereof, said polyamide characterized in that it has been prepared by the reaction of 4,4'-methylenebis(phenyl isocyanate) and the corresponding dicarboxylic acid or by the reaction of 4,4'-methylenebis(aniline) and the corresponding dicarboxylic acid dihalide, said polyamide being further characterized by an inherent viscosity of from about 0.5 to about 1.5 determined as a 0.5 percent by weight solution in N-methylpyrrolidone containing about 4 percent by weight lithium chloride at 30° C.; and

B. at least one material selected from the group consisting of,
(i) sodium benzenesulfonate,
(ii) polyethylene ionomers,
(iii) methacrylated butadiene-styrene polymers, and
(iv) multi-phase composite interpolymers comprising:
(a) about 25 to 95 weight percent of a first elastomeric phase polymerized from a monomer system comprising about 90 to 99.8 percent by weight of a C_1 to C_6 alkyl acrylate, 0.1 to 5 weight percent of a crosslinking monomer, 0.1 to 5 weight percent of a graftlinking monomer, said crosslinking monomer being a polyethylenically unsaturated monomer having a plurality of addition polymerizable reactive groups all of which polymerize at substantially the same rate of reaction, and said graftlinking monomer being a polyethylenically unsaturated monomer having a plurality of addition polymerizable reactive groups, at least one of which polymerizes at a substantially different rate of polymerization from at least one other of said reactive groups; and
(b) about 75 to 5 weight percent of a final, rigid thermoplastic phase which is polymerized in the presence of said elastomeric phase and which is free of epoxy groups

said material (B) being present in an amount at least sufficient to promote the crystallization of said linear polyamide (A).

4,536,534

ALKALINE RESISTANT PRIMER AND THE USE THEREOF

Robert Singer; Richard Goetze; Karl Maier, and Maximilian Kerbl, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Filed Dec. 29, 1983, Ser. No. 566,522

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302767

Int. Cl.³ B05D 3/02

U.S. Cl. 524—262 **14 Claims**

9. A method of coating strongly alkaline mineral substrates which comprises applying to a strongly alkaline mineral substrate a primer consisting essentially in that 100 parts by weight of the primer contains, in addition to water,

from 4 to 15 parts by weight of an alkali-soluble acrylic resin comprising from 86% to 94% by weight of monomer units derived from C_1 to C_8-alkyl esters of unsaturated acids selected from the group consisting of acrylic acid, methacrylic acid and mixtures thereof, and from 6% to 14% by weight of monomer units derived from unsaturated acids selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, crotonic acid, maleic acid, fumaric acid and mixtures thereof, and having a K-value according to Fikentscher of not more than 50,

from 4 to 40 parts by weight of organic solvents that are water-soluble in the context of the present composition and are selected from the group consisting of compounds containing hydroxy groups, carbonyl groups and mixtures of hydroxy and carbonyl groups

from 0.1 to 1.5 parts by weight of alkali metal organosiliconates, and an alkalinizing agent selected from the group consisting of ammonia, organic amines and mixtures thereof in sufficient quantities that the pH of the primer is at least 8

and from 0 to 1 part by weight of at least one compatible anti-faming agent.

4,536,535

CASTABLE CERAMIC COMPOSITIONS

Hugo R. Usala, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 501,978, Jun. 7, 1983, abandoned. This application Mar. 29, 1984, Ser. No. 594,701

Int. Cl.³ C08K 3/10

U.S. Cl. 524—403 **13 Claims**

1. A ceramic composition consisting essentially of a dispersion of:

(a) finely divided particles of ceramic solids in a solution of
(b) a mixture of compatible polymers prepared by solution polymerization of 0–100% wt. C_{1-8} alkyl methacrylate, 100–0% wt. C_{1-8} alkyl acrylate and 0–5% wt. ethylenically unsaturated carboxylic acid or amine dissolved in
(c) a nonaqueous organic solvent, the polymers being further characterized as having a number average molecular weight (M_n) of 50,000 to 100,000, a weight average molecular weight (M_w) of 150,000 to 350,000, the ratio of M_w to M_n being no greater than 5.5, the total amount of unsaturated carboxylic acid or amine in the multipolymer mixture is 0.2–2.0% wt. and the glass transition temperature of the polymer and plasticizer therein, if any, is −30° to +45° C.

4,536,536

HIGH TENACITY, HIGH MODULUS POLYETHYLENE AND POLYPROPYLENE FIBERS AND INTERMEDIATES THEREFORE

Sheldon Kavesh, Whippany, and Dusan C. Prevorsek, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 359,019, Mar. 19, 1982, Pat. No. 4,413,110, which is a continuation-in-part of Ser. No. 259,266, Apr. 30, 1981, abandoned. This application Oct. 3, 1983, Ser. No. 523,503

Int. Cl.³ C08K 5/02

U.S. Cl. 524—462 **9 Claims**

1. A polyolefin gel fiber of substantially indefinite length comprising between about 4 and about 20 weight % solid polyethylene of weight average molecular weight at least about 500,000 or solid polypropylene of weight average molecular weight at least about 750,000, and between about 80 and about 96 weight % of a swelling solvent miscible with a high boiling hydrocarbon and having an atmospheric boiling point less than about 50° C.

4,536,537

RUBBERLESS HIGH IMPACT POLYPROPYLENE

G. Bruce Klingensmith; Richard O. Whitehead, both of Houston, Tex., and Thair L. Higgins, El Cerrito, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 21, 1984, Ser. No. 623,049
Int. Cl.[3] C08K 5/01
U.S. Cl. 524—481 8 Claims

1. A polymeric composition having a high level of low temperature impact strength, said composition comprising the blend of:

(a) 78 to 65 percent by weight of a propylene homopolymer;

(b) 18 to 25 percent by weight of a linear low density ethylene copolymer; and

(c) 4 to 10 percent by weight of a hydrocarbon plasticizer, said plasticizer being a hydrogenated, highly-branched, dimer of an alpha-olefin containing about 8–12 carbon atoms, and having a viscosity in the range of about 40 to 6.5 centistokes at 38° C.

4,536,538

IMPACT MODIFIED POLYCARBONATE COMPOSITION

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 19, 1983, Ser. No. 563,183
Int. Cl.[3] C08L 69/00
U.S. Cl. 524—508 16 Claims

1. A composition comprising

a. a major amount of an aromatic polycarbonate;

b. a minor amount of an impact modifier comprising

(i) an amorphous polyester comprising units derived from 1,4-cyclohexane dimethanol and aromatic dicarboxylic acid or ester forming derivative thereof and

(ii) an olefin-acrylate copolymeric resin, the components b(i) and b(ii) in such quantities that the said composition has the foll owing properties

(a) thick section notched Izod impact resistance or ductility at break higher than a,

(b) double gate Izod impact resistance or ductility at break of a weld line higher than a+b(i) or a+b(ii),

(c) higher resistance against basic organic solution than a+b(i) as measured by notched Izod impact resistance or ductility at break in thin section.

4,536,539

DILATANT BEHAVIOR OF INTERPOLYMER COMPLEXES IN AQUEOUS SOLUTION

Robert D. Lundberg, Bridgewater; Dennis G. Peiffer, East Brunswick, and Ilan Duvdevani, Leonia, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 560,519, Dec. 12, 1983, abandoned. This application Dec. 13, 1984, Ser. No. 681,389
Int. Cl.[3] C08L 33/00, 33/06, 41/00
U.S. Cl. 524—521 6 Claims

1. A polymer complex in water which comprises the complexation in said water of:

(a) a copolymer of a first water soluble polymer backbone and an anionic comonomer, said anionic comonomer is selected from the group consisting of styrene sulfonate, vinyl sulfonate, allyl sulfonate, acrylate and acrylamidopropyl sulfonate/2-acrylamido-2-methylpropane sulfonic acid, sodium styrene sulfonate, (meth)acrylic acid and 2-sulfoethylmethacrylate; and

(b) a copolymer of a second water soluble polymer backbone and a cationic comonomer, wherein said cationic comonomer is selected from the group consisting of N,N,N-trimethylammoniumpropylmethacrylamide, vinyl pyridine/-methacrylamidopropyltrimethylammonium chloride, dimethyldiallylammoniun chloride, diethyldiallylammonium chloride, 2-methacryloxy-2-ethyltrimethylammonium chloride, trimethylmethacryloxyethylammonium methsulfate, 2-acrylamido-2-methylpropyltrimethylammonium chloride and vinylbenzyltrimethylammonium chloride; wherein said first and said second nonionic water soluble polymer backbones are selected from the group consisting of acrylamide, vinyl pyrolidone, ethylene oxide, vinyl alcohol methacrylamide, alkyl substituted acrylamides, n-vinyllactones, methacrylates and N,N-dimethylacrylamide, wherein the molar ratio of the cationic comonomer in the first polymer to the anionic monomer in the second polymer is 20/1 to 1.1/1 or 0.9/1 to 1/20.

6. A process for increasing the viscosity of water under increasing shear rates which comprises the step of adding to said water about 0.01 to about 10 grams of a polymer complex per 100 ml of said water, said polymer complex comprising:

(a) a copolymer of a first water soluble polymer backbone and an anionic comonomer, said anionic comonomer is selected from the group consisting of styrene sulfonate, vinyl sulfonate, allyl sulfonate, acrylate and acrylamidopropyl sulfonate/2-acrylamido-2-methylpropane sulfonic acid, sodium styrene sulfonate, (meth)acrylic acid and 2-sulfoethylmethacrylate; and

(b) a copolymer of a second water soluble polymer backbone and a cationic comonomer, wherein said cationic comonomer is selected from the group consisting of N,N,N-trimethylammoniumpropylmethacrylamide, vinyl pyridine/-methacrylamidopropyltrimethylammonium chloride, dimethyldiallylammonium chloride, diethyldiallylammonium chloride, 2-methacryloxy-2-ethyltrimethylammonium chloride, trimethylmethacryloxyethylammonium methsulfate, 2-acrylamido-2-methylpropyltrimethylammonium chloride and vinylbenzyltrimethylammonium chloride; wherein said first and said second nonionic water soluble polymer backbones are selected from the group consisting of acrylamide, vinyl pyrolidone, ethylene oxide, vinyl alcohol methacrylamide, alkyl substituted acrylamides, n-vinyllactones, methacrylates and N,N-dimethylacrylamide, wherein the molar ratio of the cationic comonomer in the first polymer to the anionic monomer in the second polymer is 20/1 to 1.1/1 or 0.9/1 to 1/20.

4,536,540

SCAVENGERS FOR AMMONIA IN RTV COMPOSITIONS

John J. Dziark, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 519,621, Aug. 2, 1983, abandoned. This application Jul. 9, 1984, Ser. No. 628,121
Int. Cl.[3] C08K 3/02
U.S. Cl. 524—701 40 Claims

1. A stable, one-package, substantially anhydrous and substantially acid-free, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer, comprising:

(A) an organopolysiloxane wherein the silicon atom at each chain end is terminated with at least two alkoxy radicals;

(B) an effective amount of condensation catalyst;

(C) a stabilizing amount of a silicon-nitrogen compound for scavenging hydroxy radicals, said silicon-nitrogen compound releasing ammonia as a by-product of the hydroxy-scavenging reaction; and

(D) an effective amount of a scavenger for said ammonia by-product selected from the group consisting of molecular sieves and acids and mixtues thereof.

4,536,541

HIGH IMPACT RESISTANT POLYAMIDE

Roger A. Latham, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 27, 1984, Ser. No. 584,277
Int. Cl.³ C08L 51/00, 77/00
U.S. Cl. 525—66 **8 Claims**

1. A thermoplastic composition having high impact resistance at low temperatures, said composition consisting essentially of an amorphous polyamide matrix resin, said polyamide having an apparent melt viscosity of 3000 poise or more, as measured at 280° C. and a shear rate of 100 sec.$^{-1}$, said amorphous polyamide being present in the composition in the amount of about 75 to 85% by weight of the composition, and copolymer particles that are dispersed in said amorphous polyamide said copolymer particles having a particle size, as determined by small angle X-ray scattering, of less than about 360 nm, said copolymer particles being selected from the class consisting of (a) copolymer having a Mooney viscosity of 40 to 60, containing 66 to 70% by weight ethylene, 24 to 28% by weight propylene, 5.9 to 6.4% by weight hexadiene, and 0.1 to 0.16% by weight norbornadiene, grafted with succinic anhydride groups in the amount of 0.25 to 2.25% by weight of the copolymer and (b) mixtures of (a) with the ungrafted copolymers of (a), such mixtures containing at least about 35% by weight of (a), said copolymer particles being present in an amount of at least 15% by weight the composition.

4,536,542

METHOD FOR ALTERING THE SURFACE OF THERMOPLASTIC POLYMERS

Richard B. Allen, Dalton, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Nov. 18, 1983, Ser. No. 553,173
Int. Cl.³ C08L 69/00
U.S. Cl. 525—67 **8 Claims**

1. A method for flatting the surface of an extrudable, moldable or heat formable thermoplastic polymer composition selected from

(a) an aromatic polycarbonate, an aromatic polyester carbonate, an aromatic dihydric phenol sulfone carbonate, or a mixture of any of the foregoing, alone, or in combination with

(b)

(i) a polyester resin comprising units of an aliphatic diol, a cycloaliphatic diol, or a mixture of such diols, and an aromatic diacid,

(ii) a vinyl aromatic polymer, copolymer or terpolymer, or

(iii) a mixture of (i) and (ii), said method comprising

A. blending with said polymer composition before or during processing,

(c) a copolymer comprising, by weight

(i) 40–80% ethylene,

(ii) 3–30% carbon monoxide, and

(iii) 5–60% of one or more termonomers copolymerizable therewith to produce solid terpolymers, in an amount from about 0.2 to about 15 parts by weight per 100 parts by weight of the total blend; and, thereafter,

B. extruding, molding or heat forming the blend into an article having a flatted surface and high strength.

4,536,543

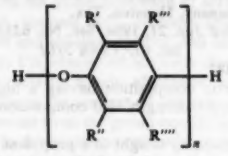
COPOLYMERS OF POLYPHENYLENE OXIDES AND POLY(ARYL ETHER)S

Markus Matzner, Edison, N.J., and Donald M. Papuga, Danbury, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

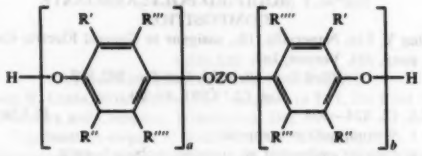
Filed Sep. 30, 1983, Ser. No. 537,849
Int. Cl.³ C08L 61/04
U.S. Cl. 525—68 **8 Claims**

1. A copolymer comprising:

(a) A polyphenylene oxide selected from the group consisting of the formula:



wherein n is at least equal to 10, R′, R″, R‴, and R⁗ are independently hydrogen, a hydrocarbon radical, a halohydrogen radical having at least 2 carbon atoms between the halogen atoms and phenol nucleus, a hydroxycarbonoxy radical, or a halohydrocarbonoxy radical having at least two carbon atoms between the halogen atoms and phenol nucleus,



wherein independently each —OZO— is a divalent quinone residue, Z is a divalent arylene radical, a and b are at least equal to 1, the sum of the a and b is at least equal to 10, and R′, R″, R‴ and R⁗ are as heretofore defined, and mixtures thereof and

(b) a thermoplastic poly(aryl ether) having recurring units of the formula:

O—E—O—E′

wherein E is the residuum of a dihydric phenol and E′ is the residuum of a dihydric benzenoid compound having an inert electron withdrawing group in at least one of the positions ortho and para to the valence bonds, both of the residuum being valently bonded to the ether oxygens through aromatic carbon atoms.

4,536,544

BLENDS CONTAINING COPOLYMERS OF POLYPHENYLENE OXIDES AND POLY(ARYL ETHER)S

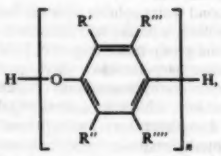
Markus Matzner, Edison, N.J., and Donald M. Papuga, Danbury, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 22, 1983, Ser. No. 564,281
Int. Cl.³ C08L 61/04
U.S. Cl. 525—68 **21 Claims**

1. A blend comprising:

(I) a copolymer comprising:

(a) A polyphenylene oxide selected from the following formulae:



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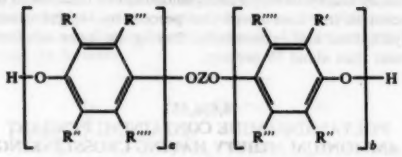


or combinations thereof, wherein n is at least equal to 10, R', R'', R''', and R'''' are independently hydrogen, a hydrocarbon radical, a halohydrocarbon radical having at least 2 carbon atoms between the halogen atoms and phenol nucleus, a hydrocarbonoxy radical, or a halohydrocarbonoxy radical having at least two carbon atoms between the halogen atoms and phenol nucleus, each —OZO— is independently a divalent aromatic residue derived from a quinone residue, Z is a divalent arylene radical, a and b are at least equal to 1, the sum of a plus b is at least equal to 10,

(b) a thermoplastic poly(aryl ether) polymer having recurring units of the formula:

O—E—O—E'

wherein E is the residuum of a dihydric phenol, and E' is the residuum of a benzenoid compound having an inert election withdrawing group in at least one of the positions ortho and para to the valence bonds, both of said residuum are valently bonded to the ether oxygens through aromatic carbon atoms;

(II) a styrene based polymer and copolymer; and

(III) a poly(aryl ether) selected from the group consisting of a poly(aryl ether sulfone), a poly(aryl ether ketone), a polyphenylene oxide, and combinations thereof.

4,536,545

GRAFT POLYMERS OF POLYMERIZABLE MONOMERS AND OLEFIN POLYMERS

Joel L. Olener, Yardley, Pa., and Leigh E. Walker, Lewiston, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 12, 1983, Ser. No. 541,225

Int. Cl.³ C08L *51/04, 51/06*

U.S. Cl. 525—75 **7 Claims**

1. A process for concurrently producing a polyolefin graft copolymer and a homopolymer or copolymer, which comprises:

(1) mixing a monomer comprising an ethylenically unsaturated polymerizable monomer in the liquid state, with a solid polymer of an aliphatic hydrocarbon monolefin of 2 to about 8 carbon atoms, wherein the olefin polymer is substantially insoluble in the monomer, but absorbs a substantial amount of the monomer, and wherein the proportion of olefin polymer is in the range of about 0.1 to about 5 percent by weight based on the weight of ethylenically unsaturated monomer, and an initiator, and

(2) heating the resulting mixture at an elevated temperature to polymerize the components to produce a mixture of solid discrete particles of the polyolefin graft copolymer and finely divided powder of the homopolymer or copolymer.

4,536,546

(METH)ACRYLATE-BASED COMPOSITIONS

Paul C. Briggs, Danvers, Mass., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 22, 1983, Ser. No. 534,918

Int. Cl.³ C08L *55/02, 51/04, 23/34*

U.S. Cl. 525—83 **24 Claims**

1. An adhesive composition consisting of: an ester monomer wherein said monomer is an acrylate ester monomer or a methacrylate ester monomer; a catalyst; and respective effective amounts of a mixture of (1) chlorinated polyethylene polymer resin and sulfonyl chloride or (2) chlorosulfonated polyethylene polymer resin and (3) a graft co-polymer resin for providing said composition with enhanced overall adhesive physical properties, said graft co-polymer resin having a backbone polymer with a glass transition temperature substantially below ambient temeprature and a grafted polymer resin having a glass transition temperature substantially above ambient temperature, with ambient being defined as the environment range within which the adhesive is being used.

4,536,547

POLYMER COMPLEXES OF A NEUTRALIZED IONIC POLYMER AND A POLYCAPROLACTONE POLYMER

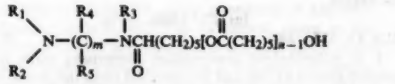
Robert D. Lundberg, Bridgewater, and Robert R. Phillips, Spring Lake Heights, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 28, 1983, Ser. No. 566,347

Int. Cl.³ C08L *51/04, 51/08, 51/00*

U.S. Cl. 525—186 **17 Claims**

1. A polymer complex of a metal neutralized sulfonated polymer and a polycaprolactone polymer said metal neutralized sulfonated polymer having about 3 to about 200 meq of metal neutralized sulfonate groups per 100 grams of said metal neutralized sulfonated polymer, said sulfonate groups being neutralized with a metal counterion selected from the Group consisting of Groups IA, IB, IIA, and IIB of the Periodic Table of Elements, said metal neutralized sulfonate groups being complexed with a polycaprolactone polymer having the formula:



wherein R_1 or R_2 is an alkyl, cycloalkyl, heterocyclic or aryl group, R_3, R_4 and R_5 are a hydrogen or alkyl, cycloalkyl, or aryl groups, m equals 1 to 20 and n equals about 1 to about 500.

4,536,548

HIGHLY TRANSPARENT, IMPACT-RESISTANT MODIFIED POLYVINYL CHLORIDE MOLDING COMPOSITIONS

Bernhard Stützel, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

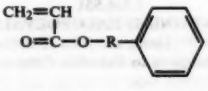
Filed May 5, 1983, Ser. No. 491,698

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216989

Int. Cl.³ C08L *27/06, 33/08;* **C08F** *265/04*

U.S. Cl. 525—227 **16 Claims**

1. A modified polyvinyl chloride molding composition, comprising (1) a major proportion of polyvinyl chloride or a copolymer comprising at least 70% by weight of vinyl chloride units; and (2) an amount effective to impart impact resistance and high transparency of (a) at least one homopolymer of an acrylate monomer having the formula



wherein R is a straight-chain or branched alkylene residue of 3–8 carbon atoms, optionally interrupted by 1–2 ether oxygen atoms, wherein the straight-chain portion of said alkylene residue contains at least 3 carbon atoms; or (b) a copylymer of said acrylate monomer and up to 30% by weight of at least one acrylate ester of a C_{4-12} aliphatic alcohol.

4,536,549

HEAT-STERILIZABLE POLYOLEFIN COMPOSITIONS AND ARTICLES MANUFACTURED THEREFROM

Kiyoshi Hattori, Franklin Lakes, N.J., and John H. Myers, Swarthmore, Pa., assignors to El Paso Polyolefins Company, Odessa, Tex.

Continuation-in-part of Ser. No. 469,882, Mar. 3, 1982, abandoned, which is a continuation-in-part of Ser. No. 450,948, Dec. 20, 1982, abandoned. This application Aug. 18, 1983, Ser. No. 524,114

Int. Cl.³ C08L 23/16, 23/08, 23/06, 23/18

U.S. Cl. 525—240 9 Claims

1. A resin composition for use in the manufacture of sterilizable, heat sealable, collapsible film bags, which resin composition consists essentially of a blend of:

(a) from about 10 to about 60 wt. % of a random copolymer of from about 1 to about 6 wt. % ethylene and of from about 94 to about 99 wt. % propylene;

(b) from about 40 to about 90 wt. % of a linear low density polyethylene produced by copolymerization of ethylene with at least one C_4–C_{18} alpha-olefin comonomer and having a density between about 0.915 and about 0.940 gm/cc.

4,536,550

POLYETHYLENE COMPOSITION

Kisoo Moriguchi, and Tadashi Ikegami, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 12, 1984, Ser. No. 599,401

Claims priority, application Japan, Apr. 21, 1983, 58-69195; Apr. 21, 1983, 58-69196; Aug. 9, 1983, 58-144385; Aug. 9, 1983, 58-144386

Int. Cl.³ C08L 23/06

U.S. Cl. 525—240 8 Claims

1. A polyethylene composition comprising three types of polyethylene (A), (B) and (C) selected from the group consisting of homopolymers of ehtylene and copolymers of ethylene and an α-olefin, wherein

(i) the polyethylene (A) has a molecular weight of from 5,000 to 90,000, the polyethylene (C) having a molecular weight of from 100,000 to 1,500,000 and the ratio of the molecular weight of the polyethylene (C)/ the molecular weight of polyethylene (A) being between 4 and 200, and the polyethylene (A) and the polyethylene (C) are produced by a polymerization using a magnesium-containing Ziegler type catalyst,

(ii) the polyethylene (B) has a molecular weight of from 50,000 to 500,000 produced by a polymerization using a chromium compound supported type catalyst capable of producing a homopolymer of ethylene in a single stage polymerization having a flow ratio of from 40 to 150 and a die swell of from 40 to 100 g/20 cm measured at the condition in which the said homopolymer exhibits a melt index of 1 g/10 min.,

(iii) the ratio of the polyethylene (A) and the polyethylene (C) by weight is from 70 to 30 to 30 to 70, and the amount of the polyethylene (B) in the composition ranges from 10% by weight to 75% by weight, and

(iv) the melt index of the composition is not less than 0.001 g/10 min., and not more than 10 g/100 min.

4,536,551

ESTER-CONTAINING HALOPOLYALKYLENES

Michael I. Naiman, St. Louis, and John A. Schield, Chesterfield, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 432,494, Oct. 4, 1982, , which is a continuation-in-part of Ser. No. 356,994, Mar. 11, 1982, Pat. No. 4,471,098. This application Jul. 2, 1984, Ser. No. 626,829

Int. Cl.³ C08F 8/22

U.S. Cl. 525—334.1 13 Claims

1. An ester-containing halogenated polyalkylene characterized by internal olefinic unsaturation, by being essentially free of crosslinking, by having a branch index of from about 2 to about 20 and by having a halogen content of from about 0.001 percent to less than about one percent by weight based on polyalkylene and, conversely, having an ester content of greater than about 99 percent.

4,536,552

POLYAMIDOAMINE CONTAINING PENDANT AMMONIUM MOIETY HAVING CROSSLINKING FUNCTIONALITY

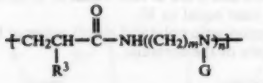
George R. Killat, and Larry R. Wilson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 336,538, Jan. 4, 1982, Pat. No. 4,416,729. This application Sep. 29, 1983, Ser. No. 537,192

Int. Cl.³ C08G 69/46

U.S. Cl. 525—451 7 Claims

1. A water soluble polyamidoamine containing a repeating unit represented by the formula:



wherein G is a pendant ammonium moiety having a cross-linking functionality, each R^3 is independently hydrogen or lower alkyl, each m is a whole number from 2 to 6, and n is a whole number from 1 to 3.

4,536,553

MODIFIED SILICON ELASTOMERS HAVING IMPROVED FLEX LIFE AND METHOD THEREFOR

Rosalyn J. Rufer, Greenbush, and Walter H. Filbert, Clifton Park, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,422

Int. Cl.³ C08L 83/06, 83/10

U.S. Cl. 525—106 24 Claims

1. A method of improving the flex life of silicone elastomers having olefinic unsaturation, comprising:

I. mixing

(a) from about 2% to about 10% by weight vinylacetate ethylene copolymer based on the weight of (b), and

(b) a silicone elastomer having olefinic unsaturation in the presence of

(c) a free radical catalyst;

II. heating the mixture of step I at an elevated temperature to cure or crosslink the mixture and

III. cooling the mixture.

21. A silicone elastomer having improved flex life comprising a silicone elastomer having olefinic unsaturation and about 2.0% to about 10.0% by weight vinyl acetate ethylene copolymer crosslinked in the presence of a free radical catalyst.

4,536,554

HYDROPHILIC POLYMERS AND CONTACT LENSES MADE THEREFROM

Drahoslav Lim; Chidambar L. Kulkarni, and Dennis A. Repella, all of San Diego, Calif., assignors to Barnes-Hind, Inc., Sunnyvale, Calif.

Filed Feb. 22, 1984, Ser. No. 582,362

Int. Cl.³ C08F 226/10; G03B 21/46

U.S. Cl. 526—264 6 Claims

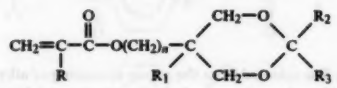
1. A contact lens comprised of an interpenetrating network polymer comprising

(a) hydrophilic vinyl pyrrolidone, 50–80% by weight;

(b) a first crosslinking agent having an affinity for hydrophilic vinyl pyrrolidone, 0.1–1.0% by weight; said first crosslinking agent being 3,3'-ethylidine-bis (N-vinyl-2-pyrrolidone), diallyl itaconate, diallyl maleate, diallyl fumarate, dimethallyl fumarate, dimethallyl maleate, dial-

lyl diglycollate, diethylene glycol bis (allyl carbonate), diallyl oxalate, diallyl adipate, diallyl succinate, diallyl azelate, divinyl benzene, divinyl adipate, or divinylethers

(c) (5-alkylene-m-dioxanyl)acrylic ester, 10–45% by weight, having the formula



wherein

R and R_1 are independently H or C_1–C_4 alkyl,

R_2 and R_3 are independently H, C_1–C_4 alkyl, or phenyl, and

n is an integer from 1–4;

(d) hydroxyalkyl acrylic ester, 0–20% by weight;

(e) a second crosslinking agent having an affinity for acrylic esters of (c) and (d), 0.1–2% by weight, said agent being neopentyl glycol dimethacrylate, ethylene glycol dimethacrylate, polyethylene glycol dimethacrylate, 1,6-hexane diol dimethacrylate, glycerol trimethacrylate, pentaerythritol trimethacrylate, pentaerythritol tetramethacrylate, trimethylol propane trimethyacrylate, allylmethacrylate, or corresponding acrylates.

4,536,555
PREPARATION OF AROMATIC POLYMERS FROM CYCLOHEXA-3,5-DIENE POLYMERS

Denis G. H. Ballard, Littleton; Andrew Courtis, Hightown, and Ian M. Shirley, Barnton, all of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 433,097, Oct. 6, 1982, Pat. No. 4,476,296. This application Aug. 8, 1984, Ser. No. 638,696

Claims priority, application United Kingdom, Oct. 6, 1981, 8130114; Oct. 6, 1981, 8130115; Oct. 6, 1981, 8130116

Int. Cl.³ C08F *32/06*

U.S. Cl. 526—295 **4 Claims**

1. A process for the preparation of polymeric compositions comprising a cyclohexadiene homo- or copolymer which process comprises treating a polymerisable composition which comprises a 1,2-disubstituted-cyclohexa-3,5-diene or homologue or analogue thereof under polymerisation conditions for the polymerisable composition, which 1,2-substituents, which may be the same or different and are selected from the group consisting of acyloxy, carbonate, alkoxy, amide, halide, thioester, urethane and xanthate.

4,536,556
PROCESS FOR THE PREPARATION OF A COPOLYMER COMPRISING ALPHA-METHYLSTYRENE AND ACRYLONITRILE

Jan Tijssen, Spaubeek, and Jozef L. M. van der Loos, Sittard, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 427,276, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 276,639, Jun. 23, 1981, abandoned. This application Nov. 4, 1983, Ser. No. 548,769

Claims priority, application Netherlands, Jul. 1, 1980, 8003798; May 16, 1981, 8102415

Int. Cl.³ C08F *212/10, 212/12*

U.S. Cl. 526—342 **3 Claims**

1. In a process for the copolymerization of alpha-methylstyrene and acrylonitrile wherein said monomers are co-polymerized

(a) in aqueous emulsion, and

(b) in the presence of a free-radical-supplying compound and a chain-transfer agent, and

(c) wherein the polymerization reaction is insufficiently cooled to remove all of the released reaction heat,

the improvement in combination therewith consisting essentially in conducting said polymerization at a temperature of the aqueous emulsion maintained at a level of at most 110° C. and while further maintaining the mean rate of temperature increase per hour, v, at a value in the range of between 5° and 60° C. per hour, wherein v is determined by the formula:

$$v = \frac{T_m - T_o}{t_m - t_o}$$

in which:

T_m = maximum temperature of the aqueous emulsion (°C.),

T_o = temperature of the aqueous emulsion at the start of the polymerization (°C.)

t_m = time in hours at which T_m is reached, and

t_o = time in hours at which the polymerization is started,

whereby the rate of monomer conversion is maximized, and whereby a heat resistant copolymer is obtained.

4,536,557
POLYMER DISPERSIONS AND THEIR USES

Duane A. Heyman, Monroe, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 600,885, Apr. 16, 1984, Pat. No. 4,503,193. This application Dec. 14, 1984, Ser. No. 681,643

Int. Cl.³ C08G *18/08, 18/16, 18/18*

U.S. Cl. 528—52 **6 Claims**

1. A process for preparing a polyurethane elastomer comprising reacting a mixture of (a) a polymer dispersion prepared by the in situ polymerization of about 10 percent to about 70 percent by weight based upon the total weight of the dispersion of an ethylenically unsaturated monomer or mixture of monomers in a chain extender of a molecular weight of 62 to less than 400 selected from the group consisting of aliphatic and/or araliphatic diols having 2 to 14 carbon atoms in the presence of a free radical polymerization initiator and a polyamide stabilizer having a pendent amide group said polyamide having an average molecular weight of from about 5,000 to about 1,000,000, wherein the weight ratio of the monomer to the polyamide is from about 2:1 to about 100:1; and (b) a compound containing two or more active hydrogen atoms as determined by the Zerewitinoff method with a molecular weight of 1000 to 8000 with an organic polyisocyanate.

4,536,558
CHAIN EXTENDED EPOXY-ESTER POLYMERIC COMPOSITIONS FOR CATIONIC ELECTRODEPOSITION

Panagiotis I. Kordomenos, Mt. Clemens, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/02034, § 371 Date Dec. 27, 1983, § 102(e) Date Dec. 27, 1983

PCT Filed Dec. 27, 1983, Ser. No. 598,553

Int. Cl.³ C08G *59/24;* C25D *13/06*

U.S. Cl. 528—100 **14 Claims**

1. A water dispersible, cathodically electrodepositable resin characterized in that said resin comprises the reaction product of:

(A) epoxide functional esters formed by chain extending

(a) polyepoxide having, on average, at least two epoxide group per molecule and a molecular weight of at least 350; with

(b) polycarboxylic acid bearing at least two carboxyl groups per molecule, wherein said polyepoxide and said polycarboxylic acid are reacted in amounts which provide between about 0.1 and about 0.8 acid groups per epoxide group; and

(B) secondary amines, wherein said ester and said amines are reacted in amounts sufficient to react essentially all of said epoxide groups of said ester with said amines,

said reaction product being dispersible in water with the aid of water soluble acid to provide cationic groups in said resin.

4,536,559

THERMALLY STABLE POLYIMIDE POLYSULFONE COMPOSITIONS FOR COMPOSITE STRUCTURES

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 17, 1983, Ser. No. 505,348

Int. Cl.³ C08G 73/10, 73/12

U.S. Cl. 528—170 **11 Claims**

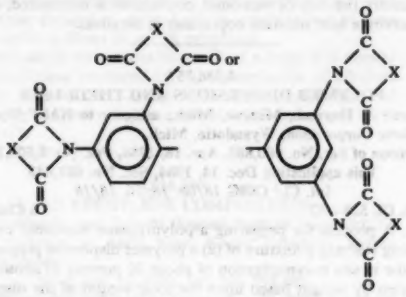
1. A cross-linkable polymer formed by reacting:

(1) 2 moles of A—OH

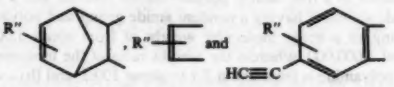
(2) n+1 moles of Z—R—Z and

(3) n moles of OH—R'—OH,

wherein A is selected from the group consisting of



or mixtures thereof wherein X is selected from the group consisting of



wherein R'' is hydrogen or a lower alkyl, wherein Z is selected from the group consisting of fluorine, chlorine, and bromine, wherein R is an aromatic radical, wherein R' is an aromatic radical, and wherein n is selected so that said polymer has a molecular weight between about 1,000 and about 40,000.

4,536,560

POLYIMIDES PREPARED FROM CYCLIC DIANHYDRIDES

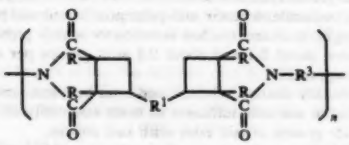
Mark L. Winzenburg, Naperville; Ellis K. Fields, River Forest, and Benjamin L. Shneider, Glen Ellyn, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 524,937, Aug. 22, 1983, Pat. No. 4,490,545. This application May 29, 1984, Ser. No. 645,333

Int. Cl.³ C08G 73/10

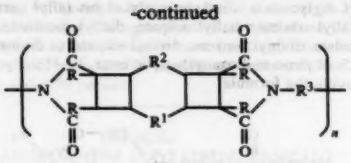
U.S. Cl. 528—188 **20 Claims**

1. As a composition of matter, a polyimide of the structure selected from the group consisting of

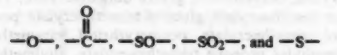


and

-continued



wherein R is selected from the group consisting of alkyl groups of 1 to 10 carbon atoms and alkylene groups of from 2 to 20 carbon atoms linked together to form a ring, R^1 and R^2 are individually selected from the group consisting of alkylene groups of 1 to 10 carbon atoms and aralkylene groups of from 8 to 20 carbon atoms, R^3 is selected from the group consisting of alkylene groups of from 2 to 10 carbon atoms, arylene and aralkylene groups of 8 to 20 carbon atoms with a provision that hydrocarbon moieties of said groups of R, R^1, R^2 and R^3 can contain stable linkages consisting of



radicals, and n is a whole number from 1 to 1000.

4,536,561

THERMOTROPIC, WHOLLY AROMATIC POLYESTERS

Manfred Schmidt, and Hans-Rudolf Dicke, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,972

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1983, 3325787

Int. Cl.³ C08G 63/60

U.S. Cl. 528—191 **3 Claims**

1. A thermotropic, wholly aromatic polyester comprising condensed residues of monomeric units (a) through (e) wherein:

(a) is p-hydroxyl-benzoic acid or p-hydroxyl-benzoic acid substituted in the nucleus by one or two C_1–C_4 alkyl, C_1–C_4 alkoxy C_6–C_{10} aryl or C_7–C_{12} alkylaryl groups,

(b) is 3-chloro-4-hydroxy-benzoic acid,

(c) is isophthalic acid,

(d) is hydroquinone and

(e) is selected from 3,4'-dihydroxy-diphenyl, 4,4'-dihydroxydiphenyl, 3,4'-dihydroxy-diphenyl ether, 4,4'-dihydroxy-diphenyl sulphide, and mixtures thereof, wherein said polyester contains the condensed residues of

(a) at a concentration of from 25 to 65 mol %,

(b) at a concentration of from 5 to 40 mol %,

(c) at a concentration of from 30 to 50 mol %, and

(d) at a concentration of from 1 to 10 mol %,

each based on the sum of the condensed residues (a), (b) and (c), with the proviso that the sum of concentrations of (a) and (b) amounts to a minimum of 50 mol % and a maximum of 70 mol % and that the molar ratio of the condensed residues c/(d+e) is from 0.95 to 1.05.

4,536,562

LIQUID CRYSTALLINE POLYESTERS

Oliver D. Deex, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

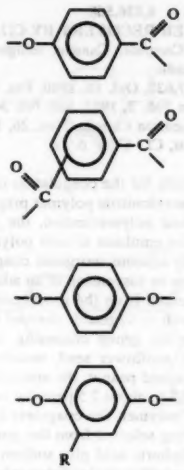
Filed Jan. 4, 1985, Ser. No. 688,832

Int. Cl.³ C08G 63/60

U.S. Cl. 528—193 **13 Claims**

1. A copolyester capable of forming a thermotropic melt phase and having an inherent viscosity of at least about 0.3 measured at 30° C. with a solution of 0.5 gm of copolyester per 100 m/ of a solvent composed of 60 weight % phenol and 40%

tetrachloroethane, consisting essentially of the following divalent radicals:



wherein the placements of the carbonyl groups of the B radicals are meta or para or a mixture of meta and para; wherein R is selected from the group consisting of alkyls of 1 to 6 carbon atoms, phenyl and phenyl substituted with an alkyl of 1 to 6 carbon atoms, chloro, bromo, cyano, formyl, acetyl, and trifluoromethyl; wherein the amount of radical A is in the range from about 10 mole % to about 60 mole % of the copolyester and wherein the amount of radical D is selected in the range from about 1 mole % up to about 50 mole % of the total amount of radicals C and D to provide a ratio of storage moduli of said copolyester determined at $T_g-50°$ C. and $T_g+50°$ C. less than the ratio of the storage moduli determined at $T_g-50°$ C. and $T_g+50°$ C. of a copolyester of identical composition except that the D radicals are replaced with C radicals.

4,536,563

PROCESS FOR MANUFACTURING POLYETHERESTERAMIDE

Kiyoshi Okitsu, and Hiroyouki Go, both of Otake, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Nov. 5, 1984, Ser. No. 668,240

Claims priority, application Japan, Nov. 18, 1983, 58-217610; Feb. 22, 1984, 59-32228

Int. Cl.³ C08G *63/04, 63/34*

U.S. Cl. 528—279 **3 Claims**

1. A process for manufacturing a polyetheresteramide, which comprises the step of reacting (A) a polyamide-forming compound selected from aminocarboxylic acids and lactams each having at least 10 carbon atoms, (B) a dicarboxylic acid having from 4 to 20 carbon atoms and (D) a polyoxyalkylene glycol having an average molecular weight of from 300 to 6,000, in the molten state, in the presence of 0.0001 to 0.00999 percent by weight, based on the total weight of the above mentioned reactants, of a tetraalkyl titanate having a straight or branched alkyl having 1 to 24 carbon atoms, at a pressure of at the highest 5 mm Hg at a temperature of 200° to 300° C.

4,536,564

POLYAMIDE FROM BIS-CARBOXY CONTAINING 3,5,3',5'-TETRAOXO-1,2-DIPIPERAZINE COMPOUND AND DIAMINE

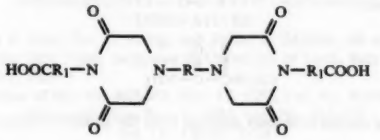
Edmund P. Woo, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 9, 1983, Ser. No. 560,034

Int. Cl.³ C08G *69/26*

U.S. Cl. 528—341 **8 Claims**

1. A compound corresponding to the formula



wherein

R is a C_{1-20} alkylene group, phenylene group, arylalkylene group, cycloalkylene group, diphenylene group, or —R_2—X—R_2—;

X is O, S or SO_2;

R_2 is a C_{1-10} alkylene group, phenylene group, arylalkylene group or a cycloalkylene group; and

R_1 is a C_{1-20} alkylene group, phenylene group, arylalkylene group or a cycloalkylene group.

4,536,565

FIRE-RESISTANT PHOSPHORUS CONTAINING POLYIMIDES AND COPOLYIMIDES

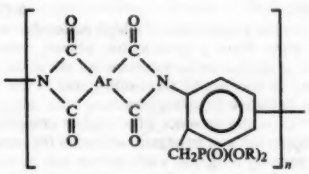
John A. Mikroyannidis, Patras, Greece, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 522,629, Aug. 12, 1983,. This application Aug. 16, 1984, Ser. No. 641,143

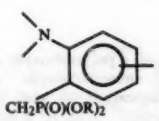
Int. Cl.³ C08G *73/10*

U.S. Cl. 528—352 **35 Claims**

1. A polymer having the formula:



wherein Ar is a tetravalent aromatic group containing from 6 to 20 carbon atoms selected from among phenyls, naphthalenes, phenanthrenes, benzophenones and benzosulfones, R is an alkyl, haloalkyl or aryl group, n is a positive integer, and the linkage of the group:



is in a 4-position or a 6-position relative to the (phosphonyl)-methyl group.

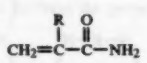
4,536,566

PROCESS FOR PREPARING SUBSTANTIALLY LINEAR POLYAMIDES FROM ACRYLAMIDE AND AQUEOUS AMMONIA

Gerald P. Coffey, Lyndhurst, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

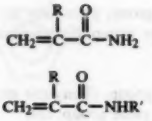
Filed May 4, 1981, Ser. No. 260,502
Int. Cl.³ C08G 69/00
U.S. Cl. 528—363 9 Claims

1. A process for preparing a substantially linear polyamide, the process comprising contacting a first monomer of the formula



(I)

with a second monomer selected from the group consisting of:



(I)

where

R is a hydrogen or methyl radical, and

R′ is a C_1–C_{12} alkyl radical,

in a molar ratio of about 1:1 to about 9:1 in the presence of at least a stoichiometric amount, based on the combined moles of the monomers, of aqueous ammonia at a temperature of at least about 190° C. and autogenous pressure.

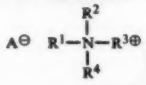
4,536,567

REMOVAL OF THE CATALYST FROM POLYPHENYLENE ETHERS

Juergen Hambrecht, Heidelberg; Rudi W. Reffert, Beindersheim; Peter Minges, and Johann Swoboda, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 631,948
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1983, 3325894
Int. Cl.³ C08G 65/44
U.S. Cl. 528—486 5 Claims

1. A process for the preparation of a high molecular weight polyphenylene ether from a monohydric phenol, which is alkyl-substituted at the two ortho-positions but not at the para-position and may or may not be alkyl-substituted at the meta-position, by an oxidative coupling reaction with oxygen at from 10° to 50° C. in the presence of a catalyst complex obtained from a copper salt and an organic amine, in the presence of from 1 to 20 parts by weight of a solvent per part by weight of the monomeric phenol, and in the presence or absence of an activator, wherein the metal component of the catalyst is removed after the polymerization by adding one or more organic ammonium salts of the formula



where $A^{\ominus}$ is an anion or polyanion of, a polycarboxylic acid, polyalkylenepolycarboxylic acid, aminocarboxylic acid, aminopolycarboxylic acid, polyaminocarboxylic acid, polyphosphonic acid or polyaminophosphonic acid, R^1 is hydrogen, R^2 and R^3 are each hydrogen, alkyl of 1 to 18 carbon atoms or aryl and R^4 is alkyl of 1 to 18 carbon atoms or aryl, and wherein the ammonium salt or salts are formed from monoalkylamines, dialkylamines, trialkylamines, arylamines or alkylarylamines.

4,536,568

EMULSION POLYMER RECOVERY BY COAGULATION

Richard H. Wunder, Corunna, Canada, assignor to Polysar Limited, Sarnia, Canada

Division of Ser. No. 197,627, Oct. 16, 1980, Pat. No. 4,345,067.
This application Feb. 3, 1982, Ser. No. 345,388
Claims priority, application Canada, Nov. 26, 1979, 340590
Int. Cl.³ C08F 6/22
U.S. Cl. 528—487 8 Claims

1. An improved process for the coagulation of a butadiene-styrene or a butadiene-acrylonitrile polymer prepared by aqueous emulsion free radical polymerization, the process being characterized in that the emulsion of said polymer is coagulated by mixing (i) with aqueous inorganic coagulant and (ii) with an aqueous solution or suspension of an additive of polysaccharide material selected from the group consisting of cereal grain flour and starch or vegetable derived proteinaceous material selected from the group consisting of cottonseed, linseed, safflower seed, sunflower seed, sesame seed, castor seed, rapeseed, soyabean and peanut, the amount of said additive being from about 0.5 to about 2.5 parts by weight per 100 parts by weight of said polymer, the coagulant for the butadiene-styrene polymer being selected from the group consisting of sulphuric acid or sulphuric acid plus sodium chloride and for the butadiene-acrylonitrile polymer being selected from the group consisting of sulphuric acid or sulphuric acid plus calcium chloride, the sulphuric acid being in sufficient quantity to maintain the pH during coagulation at below about 4.5.

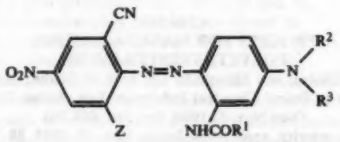
4,536,569

2-CYANO-4-NITRO-6-CHLOROPHENYLAZO 3-ACETYL-OR PROPIONYLAMINO-N,N-DI-N-PENTYL OR HEXYLANILINES

Kiyoyasu Hashimoto, Ibaraki; Kenji Yoshinaga; Yoshio Mori, both of Toyonaka; Junzaburo Seino, Kishiwada; Hirohito Kenmochi, Takatsuki, and Katsunobu Sato, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 58,158, Jul. 17, 1979, abandoned. This application Mar. 26, 1981, Ser. No. 247,869
Claims priority, application Japan, Jul. 21, 1978, 53-89716; Jul. 28, 1978, 53-92879; Sep. 22, 1978, 53-117108; Oct. 26, 1978, 53-132209; May 10, 1979, 54-57878
Int. Cl.³ C09B 29/01, 29/12, 46/00; D06P 1/18
U.S. Cl. 534—575 2 Claims

1. A compound of the formula,



wherein R^1 is methyl or ethyl, and R^2 and R^3 are each straight C_5— or C_6—alkyl, and Z is chlorine.

4,536,570

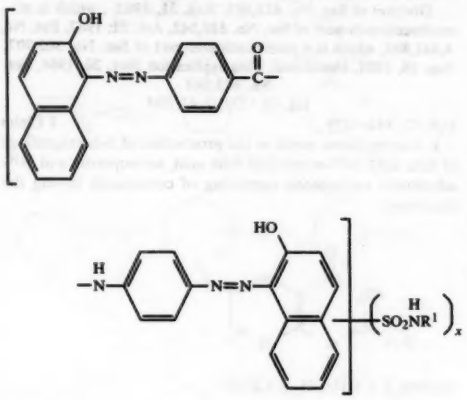
N-AMINOALKYLENESULFONAMIDO SUBSTITUTED DISAZO COLORANTS

Nathan N. Crounse, Myrtle Beach, S.C., assignor to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 195,118, Oct. 8, 1980, Pat. No. 4,379,089.
This application Oct. 25, 1982, Ser. No. 436,509
Int. Cl.³ C09B 33/02, 35/30; D06P 1/02; D21H 1/46
U.S. Cl. 534—819 2 Claims

1. A mixture consisting essentially of a disazo compound

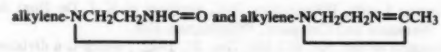
which is substituted with an average of x (N-substituted sulfonamido) groups per molecule wherein said disazo compound is of the formula



in which

x represents a number from 1 to 4, and

R^1 represents a moiety selected from the group consisting of alkylene-NH-alkylene-NH_2, alkylene-N-(non-tertiary C_1 to C_4 alkyl)$_2$,



in which alkylene represents $-CH_2CH_2-$ and $-CH_2CH_2CH_2-$; or

the acid-addition salt forms of said disazo compounds.

4,536,571

SELENIUM-CONTAINING PLATINUM COMPOUND

Richard F. Stockel, 475 Rolling Hills Rd., Bridgewater, N.J. 08807, and Philip E. Dumas, 137 Louise Dr., Morrisville, Pa. 19067

Continuation-in-part of Ser. No. 312,300, Oct. 16, 1981, abandoned. This application Apr. 14, 1983, Ser. No. 484,874

Int. Cl.³ C07H *17/00*; C07F *15/00*

U.S. Cl. 536—23 **23 Claims**

1. A selenium-containing platinum compound having the general formula(1)

(1)

wherein

R and R′ each independently stand for

a selenoalkylmonoamine,

a selenoamino acid having one amino group,

an unsubstituted or substituted selenoglucose radical,

an unsubstituted or substituted selenogalactose radical, or

an unsubstituted or substituted selenomannose radical; or

R and R′ together stand for

a selenoalkyldiamine,

a selenoaralkyldiamine,

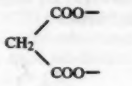
a selenoamino acid having two amino groups,

a selenonucleic acid base radical,

a selenoribosylnucleic acid base radical, or

an unsubstituted or substituted selenosemicarbazide; and

X and X′ each independently stand for Cl, No_2, or NO_3, or X and X′ together stand for $>SO_3$, $>SO_4$ or



4,536,572

AMIDO-PHENYL-α-D-GLUCOPYRANOSIDE DERIVATIVES

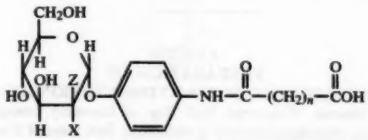
Wan S. Kim; Seo Y. Jeong, and James C. McRea, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Division of Ser. No. 442,362, Nov. 17, 1982, Pat. No. 4,444,683. This application Nov. 2, 1983, Ser. No. 532,676

Int. Cl.³ C07H *15/18*

U.S. Cl. 536—179 **7 Claims**

1. A compound of the formula



wherein X and Z are different and are selected from the group consisting of —H and —OH and n is an integer of 2 to 6.

4,536,573

PROCESS AND INTERMEDIATES FOR PRODUCTION OF BENZOTHIAZINE CARBOXAMIDES

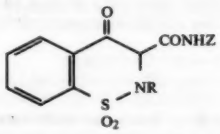
Joseph A. Kardys, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 488,208, Apr. 25, 1983, Pat. No. 4,469,866, which is a continuation-in-part of Ser. No. 389,119, Jun. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 289,390, Aug. 3, 1981, abandoned. This application May 11, 1984, Ser. No. 609,126

Int. Cl.³ C07D *401/12*, *413/12*, *417/12*

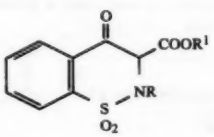
U.S. Cl. 544—49 **11 Claims**

1. A process for production of a 3,4-dihydro-2H-1,2-benzothiazine-3-carboxamide-1,1-dioxide of the formula



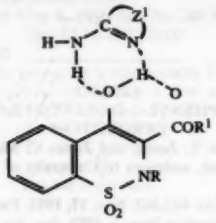
wherein R is hydrogen, benzyl or alkyl having from one to three carbon atoms; and Z is 2-pyridyl, alkyl substituted-2-pyridyl, 2-thiazolyl, 2-thiazolyl substituted by one or two alkyl groups, or 5-alkyl-3-isoxazolyl, each alkyl having from one to four carbon atoms; which comprises the steps of:

(a) contacting an ester of the formula



wherein R^1 is benzyl or alkyl having from one to four

carbon atoms, with an amine of the formula ZNH_2 in the presence of reaction inert organic solvent at a temperature of from about 50°–110° C., to provide an intermediate compound of the formula



(b) isolating the intermediate compound and heating said intermediate in the presence of reaction inert organic solvent at a temperature of from about 120°–200° C.

4,536,574

PREPARATION OF 2-ALKYLTHIOMETHYL-4-HYDROXYPYRIMIDINES

Fritz Maurer, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

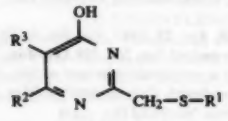
Filed Dec. 7, 1983, Ser. No. 559,147

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247926

Int. Cl.³ C07D *239/36, 239/70*

U.S. Cl. 544—253 **7 Claims**

1. A process for the preparation of a 2-alkylthiomethyl-4-hydroxypyrimidine of the formula



(I)

in which

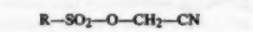
R^1 is alkyl,

R^2 is hydrogen or alkyl, and

R^3 is hydrogen, alkyl or alkoxy, or

R^2 and R^3 together represent a divalent alkylene radical,

comprising reacting a sulphonyloxyacetonitrile of the formula

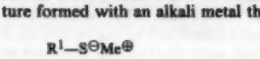


(II)

in which

R is alkyl, halogenoalkyl or optionally substituted aryl,

with methanol or ethanol, reacting the reaction mixture formed with ammonium chloride, reacting the reaction mixture formed with an alkali metal thiolate of the formula

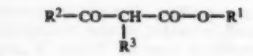


(III)

in which

Me^+ is an alkali metal cation,

and, in the presence of a base, with a β-ketocarboxylic acid ester of the formula



(IV)

at a temperature between about −20° and +100° C.

4,536,575

2-AMINO-4(3H)-OXOPYRIDO[2,3-d]PYRIMIDINO

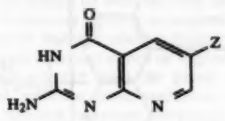
Carroll G. Temple; John A. Montgomery, and Robert D. Elliott, all of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Division of Ser. No. 413,501, Aug. 31, 1982, , which is a continuation-in-part of Ser. No. 338,542, Jan. 11, 1982, Pat. No. 4,431,805, which is a continuation-in-part of Ser. No. 305,907, Sep. 25, 1981, abandoned. This application Nov. 20, 1984, Ser. No. 673,283

Int. Cl.³ C07D *471/04*

U.S. Cl. 544—279 **1 Claim**

1. Intermediates useful in the production of 5-deaza analogs of folic acid, N^{10}-substituted folic acid, aminopterin, and N^{10}-substituted aminopterin consisting of compounds having the structures:



wherein Z is CH_2OH or CH_2Br.

4,536,576

AGRICULTURAL SULFONAMIDES

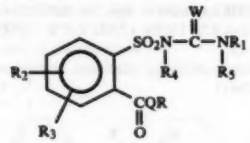
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 452,106, Dec. 22, 1982, , which is a division of Ser. No. 98,781, Nov. 30, 1979, Pat. No. 4,394,506, which is a continuation-in-part of Ser. No. 29,281, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 15,341, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 965,070, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 910,965, May 30, 1978, abandoned. This application Aug. 15, 1983, Ser. No. 523,351

Int. Cl.³ C07D *239/42;* A01N *47/36*

U.S. Cl. 544—321 **15 Claims**

1. A compound of the formula



wherein

Q is S;

R is C_1–C_{12} alkyl; C_3–C_{10} alkenyl; C_3–C_{10} alkynyl; C_2–C_6 alkyl substituted with 1–4 substituents selected from (a) 0–3 atoms of F, Cl or Br, (b) 0–2 OCH_3 groups or (c) 0–1 cyano groups;

R is also CH_2CN; $CH(R_7')CO_2CH_3$; $CH(R_7')CO_2C_2H_5$; C_3–C_6 alkenyl substituted with 1–3 atoms of F, Cl or Br;

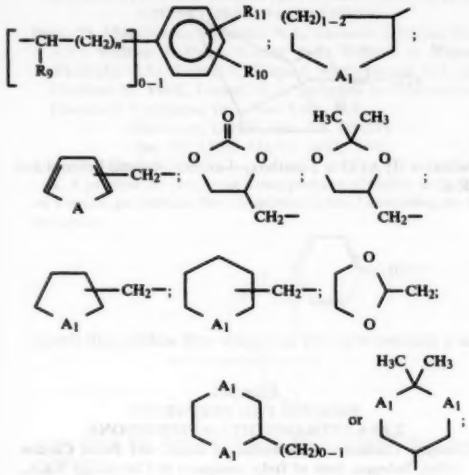
R is also C_3–C_6 alkynyl substituted with one of F, Cl or Br;

R is also C_5–C_8 cycloalkyl; C_5–C_8 cycloalkenyl; C_5–C_6 cycloalkyl substituted with (a) OCH_3, (b) C_2–C_4 alkyl, (c) F, Cl or Br or (d) 1–4 CH_3 groups;

R is also C_4–C_{10} cycloalkylalkyl; C_4–C_8 cycloalkylalkyl substituted with 1–2 CH_3 groups;

R is also C_7–C_{10} bicycloalkyl; C_7–C_{10} bicycloalkenyl; C_{10} tricycloalkyl; C_{10} tricycloalkenyl;

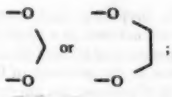
R is also



R_7' is H or CH_3;

R_9 is H or C_1–C_3 alkyl;

R_{10} and R_{11} are independently H, C_1–C_3 alkyl, Cl, Br, OCH_3, OC_2H_5 or R_{10} and R_{11} may be taken together to form a 5- or 6-member ring such as

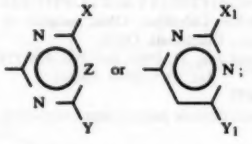


n is 0, 1, 2 or 3 provided that the total number of carbon atoms is ≦12;

A is O or S;

A_1 is O, S or SO_2;

R_1 is



R_2 is H, Cl, Br, F, C_1–C_3 alkyl, NO_2, SO_2CH_3, OCH_3, SCH_3, CF_3, $N(CH_3)_2$, NH_2 or CN;

R_3 is H, Cl, Br, F or CH_3;

R_4 is H or CH_3;

R_5 is H, CH_3 or OCH_3;

W is O or S;

X is H, Cl, CH_3, OCH_3, OCH_2CH_3 or $OCH_2CH_2OCH_3$;

Y is H; F; Cl; Br; C_1–C_4 alkyl; C(O)L; C_1–C_4 alkyl substituted with (a) OCH_3, (b) OC_2H_5, (c) CN, (d) C(O)L or (e) 1–3 atoms of F, Cl or Br;

Y is also C_3–C_4 alkenyl; $CH_2C{=}CR_{13}$; $A(CH_2)_{n'}A_1(C_1$–C_3 alkyl); $ACH_2C(O)L$; $ACH(CH_3)C(O)L$; ACH_2CH_2-C(O)L; SCN; N_3; $NR_{16}R_{17}$; OR_{14} or SR_{15};

L is NH_2, OH, $N(OCH_3)CH_3$, $NH(C_1$–C_4 alkyl), $N(C_1$–C_4 alkyl)$_2$ or C_1–C_6 alkoxy;

R_{13} is H, CH_3 or CH_2Cl;

n' is 2 or 3; A is O or S and A_1 is O, S or SO_2;

R_{16} is H or CH_3;

R_{17} is H, OCH_3, C_1–C_6 alkyl, C_1–C_4 alkyl substituted with CN;

R_{17} is also C_3–C_4 alkenyl, C_3–C_6 cycloalkyl or C_2–C_3 alkyl substituted with (a) OCH_3 or (b) OC_2H_5;

R_{14} is C_1–C_4 alkyl; C_2–C_4 alkyl substituted with 1–3 atoms or F, Cl or Br; C_1–C_4 alkyl substituted with CN; C_3–C_4 alkenyl; $CH_2C{=}CR_{13}$; or CH_2—;

R_{15} is C_1–C_4 alkyl, allyl, propargyl or C_1–C_2 alkyl substituted with CN;

Y_1 is H, OCH_3 or CH_3;

X_1 is H, Cl, OCH_3, OCH_2CH_3 or CH_3; and

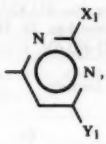
Z is CH; provided that

(a) when Y is greater than or equal to 4 carbon atoms, then R is less than or equal to 4 carbon atoms;

(b) when X is Cl, then Y is Cl and when X and Y are both H, then R is less than or equal to 4 carbon atoms;

(c) X_1 and Y_1 are not both H; and

(d) when R_1 is



then R_4 and R_5 are both H and R is ≦5 carbon atoms.

4,536,577

PROCESS FOR PREPARING 2-ALKYL-4-AMINO-5-AMINOMETHYLPYRIMIDINE

Hiroshi Yoshida, and Sadao Nilda, both of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Mar. 26, 1984, Ser. No. 593,631

Claims priority, application Japan, Apr. 7, 1983, 58-59960

Int. Cl.³ C07D *239/02*

U.S. Cl. 544—326 **16 Claims**

1. A process for preparing 2-alkyl-4-amino-5-aminomethylpyrimidine comprising;

(i) a first step of reacting 2-alkyl-4-amino-5-formylpyrimidine with ammonia in an inert solvent in the presence of at least one compound selected from heteropolyacids, isopolyacids, oxyacids and salts thereof containing molybdenum or tungsten, and

(ii) a second step of reacting the reaction product in the first step catalytically with ammonia and hydrogen in an inert solvent in the presence of a reducing catalyst.

4,536,578

1-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-YL)PROPYL]-4-(SUBSTITUTED)PIPERAZINES

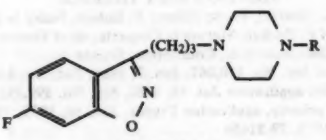
Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 9, 1982, Ser. No. 366,248

Int. Cl.³ C07D *401/04, 413/06;* A61K *31/495*

U.S. Cl. 544—360 **19 Claims**

1. A compound of the formula



wherein R is loweralkyl, benzyl, 2-hydroxyethyl, pyridyl or a group of the formula

wherein R_1 is hydrogen, loweralkyl, loweralkoxy, halogen or trifluoromethyl; the optical antipodes thereof; or pharmaceutically acceptable acid addition salts thereof.

4,536,579

PYRIMIDINES SUBSTITUTED BY NITROGEN-CONTAINING HETEROCYCLIC RINGS AS INTERMEDIATES

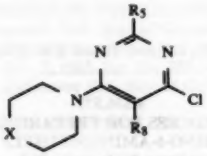
James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 471,837, Mar. 3, 1983, Pat. No. 4,477,450. This application Feb. 24, 1984, Ser. No. 583,387

Int. Cl.³ C07D *405/04, 413/04, 417/04*

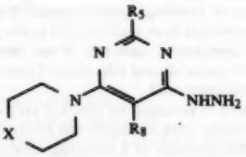
U.S. Cl. 544—58.2 **2 Claims**

1. A compound of the formula



wherein R_5 is hydrogen, lower alkyl, phenyl or lower alkylthio; R_8 is hydrogen, phenyl or lower alkyl; and X is oxygen, sulfur, sulfinyl, sulfonyl, methylene, imido or N-lower alkylimido.

2. A compound of the formula



wherein R_5 is hydrogen, lower alkyl, phenyl or lower alkylthio; R_8 is hydrogen, phenyl or lower alkyl; and X is oxygen, sulfur, sulfinyl, sulfonyl, methylene, imido or N-lower alkylimido.

4,536,580

4-AMINO-5-BROMO-2-METHOXY-N-[8-(BENZYL)-8-AZABICYCLO[3.2.1]-3-YL-BENZAMIDE OR A PHARMACOLOGICALLY ACCEPTABLE ACID ADDITION SALT THEREOF

Philippe L. Dostert, Paris; Thierry F. Imbert, Noisy le Roi, and Bernard P. Bucher, Marnes la Coquette, all of France, assignors to Delalande S.A., Courbevoie, France

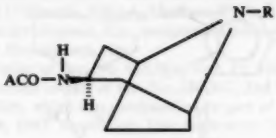
Division of Ser. No. 110,067, Jan. 7, 1980, Pat. No. 4,471,120. This application Jul. 19, 1982, Ser. No. 399,392

Claims priority, application France, Jan. 16, 1979, 79 00971; Dec. 26, 1979, 79 31656

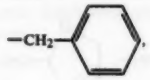
Int. Cl.³ C07D *451/04*

U.S. Cl. 546—124 **1 Claim**

1. A compound having the formula



wherein (I) ACO is 2-methoxy-4-amino-5-bromo benzoyl and R is



or a pharmacologically acceptable acid addition salt thereof.

4,536,581

PROCESS FOR PREPARING 2,2,6,6-TETRAMETHYL-4-PIPERIDONE

Giuseppe Cantatore, Casalecchio di Reno, and Paolo Cassandrini, Bologna, both of Italy, assignors to Ciba-Geigy S.p.A., Origgo, Italy

Continuation-in-part of Ser. No. 159,169, Jun. 13, 1980, abandoned, which is a continuation of Ser. No. 21,194, Mar. 16, 1979, abandoned. This application May 18, 1983, Ser. No. 495,713

Claims priority, application Italy, Mar. 31, 1978, 21858 A/78

Int. Cl.³ C07D *211/74*

U.S. Cl. 546—242 **2 Claims**

1. In a process for preparing 2,2,6,6-tetramethyl-4-piperidone from ammonia and acetone, in a single stage for a time of 2 to 8 hours, at a temperature of 50° to 120° C. and at a pressure of 1 to 50 atmospheres, in the presence of 0.001–0.1 moles of acid catalysts per mole of acetone, the improvement consisting in reacting the acetone and ammonia in a molar ratio of 20:1 to 4:1.

4,536,582

HEAT CURABLE SOLVENTLESS LIQUID PREPOLYMER AND NOVEL MONOMER PREPARED FROM N-(2-HYDROXYALKYL)PHTHALIMIDE

Richard A. Markle, Columbus, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

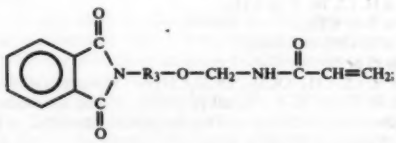
Filed Jan. 21, 1983, Ser. No. 459,778

Int. Cl.³ C07D *209/48*

U.S. Cl. 548—477 **5 Claims**

1. A liquid heat curable prepolymer comprising the reaction product of,

from about 4 to about 10% of an acrylamide having the following formula:



wherein R_3 represents C_1 to about C_{10} alkyl; from about 65% to about 75% of a rubber formable monomer selected from the group consisting essentially of conjugated dienes, alkyl esters of acrylic acid and alkyl esters of methacrylic acid; and

from about 20 to about 30% of a nitrile monomer selected from the group consisting essentially of acrylonitrile and methacrylonitrile.

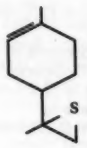
4,536,583

PROCESS FOR PREPARING MIXTURES CONTAINING 8,9-EPITHIO-1-P-MENTHENE

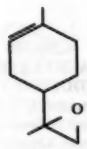
Braja D. Mookherjee, Holmdel, N.J.; Bernard J. Chant, Rye, N.Y.; William J. Evers, Locust, N.J.; Richard A. Wilson, Westfield, N.J.; Michael J. Zampino, North Bergen, N.J., and Manfred H. Vock, Locust, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,371
Int. Cl.³ C07D *331/02*; A61K *7/46*
U.S. Cl. 549—1 **1 Claim**

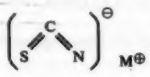
1. A process for preparing a composition of matter including as a major proportion the compound defined according to the structure:



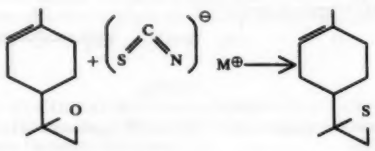
comprising the step of reacting the compound having the structure:



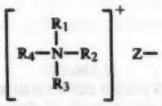
with an alkali metal thiocyanate having the structure:



according to the reaction:



wherein M represents alkali metal in the presence of a phase transfer catalyst, said phase transfer catalyst having the general formula:



wherein at least one of R_1, R_2, R_3 and R_4 is C_6–C_{14} aryl, C_6–C_{10} aralkyl, C_6–C_{20} alkyl, C_6–C_{14} alkaryl and C_6–C_{20} alkenyl and the other of R_2, R_3 and R_4 is alkyl selected from the group consisting of methyl, ethyl, n-propyl, i-propyl, 1-butyl, 2-butyl, 1-methyl-2-propyl, 1-pentyl and 1-octyl and Z^- is an anion selected from the group consisting of chloride, bromide and hydroxide, the reaction temperature varying from about 45° C. up to about 85° C.; the pressure of reaction varying from one atmosphere up to 10 atmospheres; the mole ratio of alkali metal thiocyanate:epoxide varying from about 8:1 down to about 1:1; the said alkali metal thiocyanate being dissolved in water with the alkali metal thiocyanate being in a concentration of between 10% and 50% in said water.

4,536,584

PROCESS FOR THE THERMOCHEMICAL CONVERSION OF BIOMASS

Abolghassem Eskamani, Aurora, and Warren H. Krause, Cleveland, both of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Oct. 3, 1983, Ser. No. 538,245
Int. Cl.³ C07C *31/00, 45/00*
U.S. Cl. 549—429 **10 Claims**

1. A process for the thermochemical conversion of plant-derived biomass having a conversion rate of at least 90 percent and wherein at least 3 percent of the converted biomass, based on the total weight of the biomass, are C1–C5 alcohols, aldehydes and ketones, which process comprises contacting said biomass with a ruthenium-bearing catalyst under reducing conditions at a temperature of at least 100° C. and at pressure of at least 40 atmospheres.

4,536,585

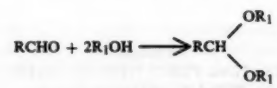
METHOD OF MAKING ACETALS BY CATALYTIC REACTION OF ALDEHYDES WITH HYDROXYALKANES

Christos Paparizos, Willowick; Robert S. Shout, Bedford Heights, and Wilfrid G. Shaw, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

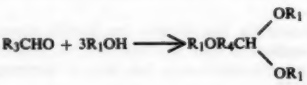
Filed Dec. 5, 1983, Ser. No. 557,775
Int. Cl.³ C07D *317/00*
U.S. Cl. 549—453 **6 Claims**

1. A process which comprises reacting a C_1 to C_{12} saturated aldehyde or a C_3 to C_{12} unsaturated aldehyde with

(1) a C_1 to C_{12}, monohydroxyalkane, to produce an acetal, as follows:

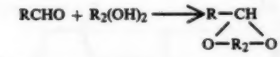


in the case of a saturated aldehyde, or to produce an acetalic ether, as follows:

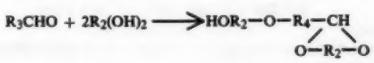


in the case of an unsaturated aldehyde, or with

(2) a C_2 to C_3 dihydroxyalkane, to produce a closed ring acetal, as follows:



in the case of a saturated aldehyde, or to produce a closed ring acetalic ether, as follows:



in the case of an unsaturated aldehyde,

said reacting being effected by intimately contacting a mixture of the reactants with a particulate solid metallic catalyst comprising an alloy of palladium and thallium,

wherein

R is alkyl having 1–12 carbon atoms,

R_1 is alkyl having 1–12 carbon atoms,

R_2 is selected from $—CH_2CH_2—$, $—CH_2CH_2CH_2—$ and $—CH(CH_3)CH_2—$,

R_3 is alkenyl having 2–12 carbon atoms, and

R_4 is the hydrocarbon residue of the group resulting from the addition of a hydroxyl group in ROH or $R_2(OH)_2$, across the double bond of R_3.

4,536,586

TRIMETHYL 6-OXABICYCLO[3.2.1]OCTAN-4-OLS AND 4-ONES

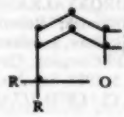
James E. Powell, Ripon, Calif., assignor to Shell Development Company, Houston, Tex.

Division of Ser. No. 487,326, Apr. 21, 1983, Pat. No. 4,486,219. This application Jun. 11, 1984, Ser. No. 619,419

Int. Cl.³ C07D 307/00

U.S. Cl. 549—463 **2 Claims**

1. A compound of the formula



wherein each R is a methyl group and X is —OH or =O.

4,536,587

COMBATING PESTS WITH SUBSTITUTED BENZOYL-(THIO)UREAS

Wilhelm Sirrenberg, Sprockhoevel; Albrecht Marhold, Leverkusen; Ingeborg Hammann, Cologne; Ingomar Krehan, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

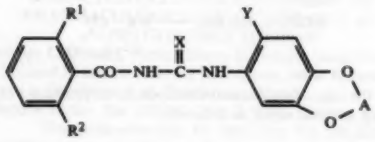
Continuation of Ser. No. 268,961, Jun. 1, 1981, abandoned. This application May 12, 1983, Ser. No. 493,910

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023328

Int. Cl.³ C07D 319/14, 317/44

U.S. Cl. 549—366 **15 Claims**

1. A compound of the formula



in which

R^1 represents a hydrogen or halogen atom or an alkyl radical,

R^2 represents a hydrogen or halogen atom,

X represents an oxygen or sulphur atom,

Y represents a hydrogen or halogen atom or an alkyl or halogenoalkyl radical and

A represents a C_{1-2}-alkylene radical which is substituted by fluorine and optionally additionally substituted by chlorine, with the proviso that when A is ethylene at least one of R^1 and R^2 must be halogen.

13. The method according to claim 12, wherein said compound is

N-2,6-difluorobenzoyl-N'-(2,2,3-trifluoro-3-chloro-1,4-benzodioxin-6-yl)-urea,

N-(2-chloro-6-fluoro-benzoyl)-N'-(2,2,3-trifluoro-1,4-benzodioxin-6-yl)-urea,

N-2,6-difluorobenzoyl-N'-(2,2-difluoro-benzodioxol-5-yl)urea,

N-2,6-difluorobenzoyl-N'-(2,3,3-trifluoro-7-chloro-1,4-benzodioxin-6-yl)-urea,

N-(2-chloro-6-fluoro-benzoyl)-N'-(2,2,3-trifluoro-3-chloro-1,4-benzodioxin-6-yl)-thiourea,

N-2,6-difluorobenzoyl-N'-(2,2,3-trifluoro-3-chloro-1,4-benzodioxin-6-yl)-thiourea or

N-(2-fluorobenzoyl)-N'-(2,2,3,3-tetrafluoro-1,4-benzodioxin-6-yl)-thiourea.

4,536,588

ACETAL GLYCOL DIACRYLATES AND PROCESS FOR PRODUCING THEM

Minoru Yokoshima, Yamaguchi; Kazuyoshi Nawata, Onoda; Tetsuo Ohkubo, Ube, and Hideaki Hattori, Yamaguchi, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

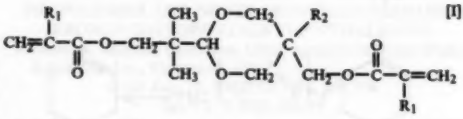
Filed Jun. 13, 1983, Ser. No. 503,572

Claims priority, application Japan, Jun. 24, 1982, 57-107575

Int. Cl.³ C07D 319/06

U.S. Cl. 549—374 **4 Claims**

1. Acetal glycol diacrylates represented by the following general formula [I]:



[I]

wherein R_1 represents H or CH_3 and R_2 represents CH_3, C_2H_5 or C_3H_7.

4,536,589

POLYMERS OF FERROCENE

Jere D. Fellmann, Ashland; Philip E. Garrou, Holliston, both of Mass.; Howard P. Withers, Jr., Reading, Pa., and Dietmar Seyferth, Lexington, Mass., assignors to The Dow Chemical Company, Midland, Mich.

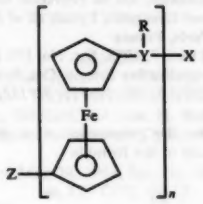
Filed Nov. 9, 1981, Ser. No. 319,827

Int. Cl.³ C07F 9/66, 9/90, 17/02

U.S. Cl. 556—14 **8 Claims**

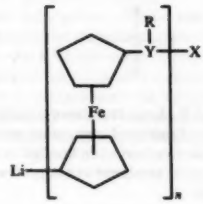
1. A linear polymer of ferrocene substantially free from

heteroannular moieties having an absolute molecular weight from about 8.000 to about 160,000 amu having the formula:



where R is a hydrocarbyl or an oxy containing hydrocarbyl radical of up to about 10 carbons selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, alkenyl, aralkenyl, alkoxy, aryloxy and alkoxyaryl radicals; Y is triavalent phosphorus, arsenic or antimony; X is halo, hydroxy, R, or an ester group of up to about 10 carbons; Z is lithium, hydrogen or a group of the formula $Y(R)_2$ where Y and R are as previously defined; and n is an integer greater than 2.

2. A process for producing linear polymers of ferrocene corresponding to the formula



where R is a hydrocarbyl or hydrocarboxyl radical of up to about 10 carbons selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, alkenyl, aralkenyl, alkoxy, aryloxy and alkoxyaryl radicals; Y is trivalent phosphorus, arsenic or antimony; X is halo; and n is an integer greater than 2, comprising reacting 1,1'-dilithioferrocene with a reactive compound of formula X_2YR where X, Y and R are as previously defined, by controllably adding the reactive compound to the 1,1'-dilithioferrocene at a rate such that formation of dimer by-products is substantially avoided.

4,536,590

PHENYL-CONTAINING ORGANOPOLYSILOXANES

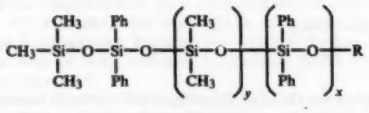
Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 893,687, Apr. 5, 1978, abandoned, which is a continuation of Ser. No. 506,007, Sep. 16, 1974, abandoned. This application May 25, 1979, Ser. No. 42,349

Int. Cl.³ C07F *7/04, 7/18*

U.S. Cl. 556—453 **5 Claims**

1. A phenyl-containing organopolysiloxane fluid consisting essentially of a polymer of the general formula



wherein Ph is phenyl, R is selected from the group consisting of hydrogen, trimethylsilyl and mixtures thereof, and wherein x and y have a combined value sufficient to provide a phenyl content of from about 7 weight percent to about 80 weight percent.

4,536,591

INSECTICIDAL [1,1'-BIPHENYL]-3-YLMETHYL ESTERS

Ernest L. Plummer, Yardley, Pa., assignor to FMC Corporation, Philadelphia, Pa.

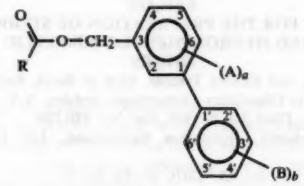
Continuation of Ser. No. 265,940, May 21, 1981, Pat. No. 4,402,973, which is a continuation-in-part of Ser. No. 193,056, Oct. 2, 1980, Pat. No. 4,329,518, which is a continuation-in-part of Ser. No. 76,636, Sep. 18, 1979, abandoned, which is a division of Ser. No. 966,405, Dec. 4, 1978, Pat. No. 4,214,004. This application Feb. 7, 1983, Ser. No. 464,242

The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.

Int. Cl.³ C07C *69/743, 69/747;* A01N *53/00*

U.S. Cl. 560—8 **3 Claims**

1. A compound of the formula



wherein

(1) b is 0, a is 3 or 4, and R is selected from 2,2,3,3-tetramethylcyclopropyl, 2,2-dichloro-3,3-dimethylcyclopropyl, 3-cyclopentylidenemethyl-2,2-dimethylcyclopropyl, 3-(2-methyl-1-propenyl)-2,2-dimethylcyclopropyl, and 3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethylcyclopropyl, and when a is 3,

A is fluoro, or A is 2-chloro, 2-bromo, 2-methyl, or 2-ethyl with two additional fluoro groups, or A is 2- and 4-substituents independently selected from fluoro, chloro and methyl with one additional fluoro group, and

when a is 4,

A is fluoro, or A is 2- and 4-substituents independently selected from fluoro, chloro and methyl with two additional fluoro groups; or

R is selected from 3-[(2-chloro-2-phenyl)ethenyl]-2,2-dimethylcyclopropyl, 1-(4-chlorophenyl)-2-methylpropyl, 2,2-dichloro-1-(4-ethoxyphenyl)cyclopropyl, and 1-(2-chloro-4-trifluoromethylphenylamino)-2-methylpropyl, a is 3 or 4, and A is fluoro; or

(2) a is 3 or 4, b is 4, R is selected from 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropyl and 3-(2,2-dibromoethenyl)-2,2-dimethylcyclopropyl, and

A is fluoro or a 2-substituent selected from chloro, bromo, and lower alkyl with 2 or 3 fluoro groups, and B is fluoro or a 2'-substituent selected from chloro and methyl with 3 fluoro groups.

2. An insecticidal or acaricidal composition comprising an insecticidally or acaricidally effective amount of at least one compound of claim 1 in admixture with an agriculturally acceptable carrier.

4,536,592

2-SUBSTITUTED PROSTAGLANDINS

Paul W. Collins, Deerfield; Alan F. Gasiecki, Vernon Hills, and Richard M. Weier, Lake Bluff, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Feb. 16, 1984, Ser. No. 580,966

Int. Cl.³ C07C *177/00*

U.S. Cl. 560—53 **6 Claims**

1. A compound which is methyl 7-[3α-hydroxy-2β-4(RS)-4-

hydroxy-4-methyl-1-trans-octenyl)-5-oxocyclopentane]-1α-2-allyl heptanoate.

2. A compound which is methyl 7-[3α-hydroxy-2β-4(RS)-4-hydroxy-4-methyl-1-trans-octenyl)-5-oxocyclopentane]-1α-2-benzyl-heptanoate.

3. A compound which is methyl 7-[3α-hydroxy-2β-4(RS)-4-hydroxy-4-methyl-1-trans-octenyl)-5-oxocyclopentane]-1α-2-cyclopentyl heptanoate.

4. A compound which is methyl 7-[3α-hydroxy-2β-4(RS)-4-hydroxy-4-methyl-1-trans-octenyl)-5-oxocyclopentane]-1α-2-iodo-heptanoate.

5. A compound which is ethyl 7-[3α-hydroxy-2β-4(RS)-4-hydroxy-4-methyl-1-trans-octenyl)-5-oxocyclopentane]-1α-2-fluoro-heptanoate.

4,536,593

PROCESS FOR THE PREPARATION OF STERICALLY HINDERED HYDROXPHENYLCARBOXYLIC ACID ESTERS

Ivan Orban, and Eduard Troxler, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

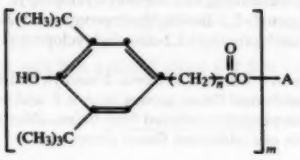
Filed Jul. 5, 1983, Ser. No. 510,705

Claims priority, application Switzerland, Jul. 13, 1982, 4264/82

Int. Cl.³ C07C *69/88, 69/76*

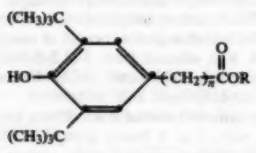
U.S. Cl. 560—75 **8 Claims**

1. A process for the preparation of a compound of formula I



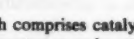
(I)

in which n is a number from 0 to 2, m is a number from 1 to 4 and A is a radical which has 2 to 18 carbon atoms and is derived from an m-hydric aliphatic alcohol, by transesterifying about m mols of an ester of formula (II)



(II)

in which R is methyl or ethyl, with an alcohol of formula III



(III)

which comprises catalysing the transesterification by successive treatment under atmospheric pressure in the presence of an inert solvent with a catalytic amount of (a) a tin compound of formula V

(V)

in which R_2 is C_4–C_{18}-alkyl, and (b) an acid earth.

4,536,594

PROCESS FOR THE PREPARATION OF BETA-DISUBSTITUTED MONOCARBOXYLIC ACIDS

Patrice P. M. Deschamps, Aix en Provence; Roger Gallo, Bouc Bel Air, and Henri Grangette, Lyons, all of France, assignors to Elf France, Paris, France

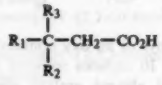
Filed Oct. 7, 1983, Ser. No. 540,118

Claims priority, application France, Oct. 8, 1982, 82 16907

Int. Cl.³ C07C *51/00, 53/126, 53/132, 53/134*

U.S. Cl. 562—400 **13 Claims**

1. A process for the preparation of a beta-disubstituted monocarboxylic acid of the formula



(I)

wherein R_1, R_2, and R_3 are identical or different and each represents a saturated or unsaturated monovalent hydrocarbon radical containing from 1 to 22 carbon atoms or R_1 and R_2 are interbonded to form with the carbon atoms to which they are attached a monocyclic or bicyclic structure comprising from 5 to 22 carbon atoms which comprises reacting a hydrocarbon of the formula

(II)

wherein R_1, R_2 and R_3 have the above meaning, with vinylidene chloride, and a functional compound wherein the molecule contains a tertiary carbon atom bonded to the heteroatom of a functional group or an alkene in the presence of a concentrated protonic acid.

4,536,595

PROCESS FOR THE PREPARATION OF ALPHA-ARYL-PROPIONIC ACIDS AND ALKALINE SALTS THEREOF

Andrea Gardano, Trino Vercellese; Franco Francalcanci, and Marco Foà, both of Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

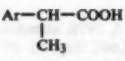
Filed Sep. 17, 1982, Ser. No. 419,616

Claims priority, application Italy, Sep. 21, 1981, 24054 A/81

Int. Cl.³ C07C *51/10*

U.S. Cl. 562—406 **16 Claims**

1. A process for the preparation of alkaline salts of alpha-arylpropionic acids having formula (I):



(I)

wherein Ar represents an aromatic or heteroaromatic group containing one or more rings, however linked to each other, having in total up to 20 carbon atoms, by reaction with carbon monoxide, of the corresponding secondary hailides of formula (II):

(II)

wherein Ar has the same meaning as in formula (I) and where X is a halogen selected from Cl and Br, characterized in that the reaction is conducted in an anhydrous alcoholic solvent medium consisting of alkanols having up to 4 carbon atoms, in the presence of alkaline hydroxides, and in presence, as cata-

lyst, of a salt of cobalt hydrocarbonyl, at a temperature comprised between 0° C. and 50° C. and at substantially atmospheric pressure.

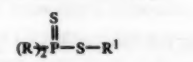
4,536,596

EXTRACTION OF AMINO ACIDS FROM AQUEOUS SOLUTION WITH DITHIOPHOSPHINATES

Christos Savides, Fairfield, and John H. Bright, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 14, 1984, Ser. No. 609,947
Int. Cl.³ C07C 99/12
U.S. Cl. 562—443 **12 Claims**

1. A method for recovering monocarboxylic amino acids free of hydroxy groups from aqueous solutions thereof which comprises contacting such a solution with a sufficient amount of a dithiophosphinate having the formula:



wherein each R, individually, is an alkyl or cycloalkyl radical of 4–18 carbon atoms, inclusive, an aryl radical of 6–18 carbon atoms, inclusive, an aralkyl radical of 7–20 carbon atoms, inclusive, or both Rs, together with the phosphine atoms, form either a 5 or 6 membered ring which may contain oxygen, or a bicyclic radical, and R^1 is hydrogen or a cation, in the presence of an organic diluent which forms a substantially water-insoluble liquid when in contact with the dithiophosphinate under extraction conditions to extract said amino acid and separating the extracted solution from said dithiophosphinate.

4,536,597

SELECTIVE HYDROCARBOXYLATION OF PROPYLENE TO ISOBUTYRIC ACID

Frederick A. Pesa, Aurora, and Thomas A. Haase, University, both of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Dec. 31, 1979, Ser. No. 108,435
Int. Cl.³ C07C 51/14, 53/124
U.S. Cl. 562—522 **36 Claims**

1. A process for the selective hydrocarboxylation of propylene to produce butyric acid in the liquid phase at a temperature of about 75° C. to about 150° C. and a pressure of about 250 psi to about 5000 psi, wherein the isobutyric acid isomer product predominates, comprising forming a reaction mixture of propylene, carbon monoxide and water in the presence of a carboxylic acid-containing solvent and a catalyst comprising (i) a coordinating palladium compound, (ii) an organoarsine ligand and (iii) a complexing hydrogen halide; and maintaining a water to propylene ratio of from about 0.01 to a value less than 1.0.

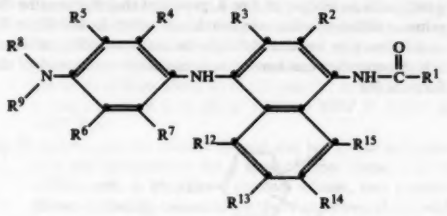
4,536,598

COLOR-FORMING CARBOXAMIDONAPHTHALENE DYE PRECURSOR AND CARBOXIMIDE DYE IN PHOTOGRAPHIC MATERIAL AND PROCESS

James E. Kiljanowicz, Pittsford, and Csaba A. Kovacs, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 382,546, May 27, 1982, Pat. No. 4,423,126. This application Mar. 10, 1983, Ser. No. 473,925
Int. Cl.³ C07C 127/19, 103/44, 103/82
U.S. Cl. 564—49 **15 Claims**

1. A color-forming compound represented by the formula:



wherein:

R^1 is alkyl containing 1 to 25 carbon atoms, cycloalkyl containing 5 to 8 carbon atoms, aryl containing 6 to 25 carbon atoms, alkoxy containing 1 to 25 carbon atoms, aryloxy containing 6 to 25 carbon atoms,

or a 5 or 6 member heterocyclic group;

R^2, R^3, R^4, R^5, R^6, and R^7 are individually hydrogen, alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, alkoxy containing 1 to 25 carbon atoms, arylsulfonyl containing 6 to 25 carbon atoms, chlorine, bromine, carbamoyl, sulfamoyl, carboxy, sulfonamido; and carboxamido;

R^8 is hydrogen, alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, acyl containing 2 to 25 carbon atoms, or carbamoyl containing 2 to 25 carbon atoms;

R^9 is alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, acyl containing 2 to 25 carbon atoms, or carbamoyl;

R^{10} and R^{11} are individually hydrogen, alkyl containing 1 to 25 carbon atoms, aryl containing 6 to 25 carbon atoms, a carbocyclic group containing 6 to 8 carbon atoms, or taken together represent the atoms necessary to complete a 5 or 6 member heterocyclic ring;

R^{12}, R^{13}, R^{14}, and R^{15} are individually hydrogen, alkyl containing 1 to 25 carbon atoms, cyano, sulfamoyl, chlorine, carboxamido, sulfonamido, bromine and alkoxy containing 1 to 25 carbon atoms.

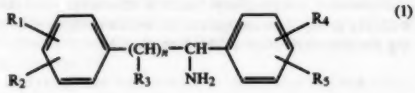
4,536,599

SYNTHESIS OF AMINE DERIVATIVES

Fujio Masuko, Ohita, and Tadashi Katsura, Itami, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 65,429, Aug. 10, 1979, abandoned. This application Nov. 1, 1979, Ser. No. 90,479
Claims priority, application Japan, Aug. 22, 1978, 53-102614; Aug. 30, 1978, 53-106541
Int. Cl.³ C07C 102/00, 87/28
U.S. Cl. 564—124 **2 Claims**

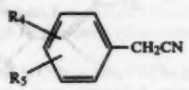
1. A process for preparing an amine derivative of the formula (1),



(1)

wherein R_1, R_2, R_3, R_4, and R_5 are independently hydrogen atom, a halogen atom, a hydroxy, trihalogenomethyl, phenyl, phenoxy or phenylthio group, or a straight or branched C_1–C_6

alkyl, alkenyl, alkoxyl, alkylthio, dialkylamino or alkylsulfonyl group, n is an integer of 1 to 3, provided that R_3s may be the same or different when n is 2 or 3, and either R_1 and R_2 or R_4 and R_5 may be bonded through the same or different atom, which comprises condensing an acetonitrile compound of the formula (4),

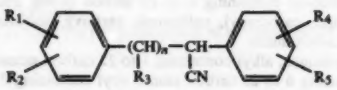


(4)

wherein R_4 and R_5 are as defined above, with a halide compound of the formula (5),

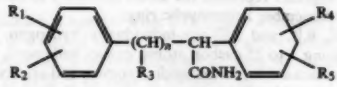
(5)

wherein R_1, R_2, R_3 and n are as defined above and X is a halogen atom, in the presence of a base to produce a nitrile compound of the formula (3),



(3)

wherein R_1, R_2, R_3, R_4, R_5, and n are as defined above, hydrolyzing said compound of the formula (3) using as a catalyst an organic quaternary ammonium salt and/or tertiary amine in the presence of a base and hydrogen peroxide to produce an amide compound of the formula (2),



(2)

wherein R_1, R_2, R_3, R_4, R_5 and n are as defined above, and contacting said amide compound of the formula (2) with a halogen, an alkali metal hypohalite or an alkaline earth metal hypohalite in the presence of a base.

2. A process for preparing an amide derivative represented by the general formula (I),

$$R—CONH_2 \quad (I)$$

wherein R represents a straight or branched C_1–C_6 alkyl or alkenyl group, or a phenyl or aralkyl group, provided that said alkyl or alkenyl group may further have a halogen atom, or an alkoxyl, alkylthio, dialkylamino, alkylsulfonyl, phenyl, phenoxy, phenylthio or hydroxy group, and said phenyl or aralkyl group may further have an alkyl, alkenyl, alkoxyl, alkylthio, dialkylamino, alkylsulfonyl, phenyl, phenoxy, phenylthio or hydroxy group, or a halogen atom, which comprises hydrolyzing a nitrile derivative of the formula (II),

$$R—CN \quad (II)$$

wherein R is as defined above, in the presence of a base and hydrogen peroxide by using an organic quaternary ammonium salt and/or a tertiary amine as a catalyst.

4,536,600

POLYOXYALKYLENEPOLYACRYLAMIDES AND THE PREPARATION THEREOF

Ernest L. Yeakey, and Lewis W. Watts, Jr., both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 279,906, Jul. 2, 1981, Pat. No. 4,393,237. This application May 25, 1983, Ser. No. 497,948

The portion of the term of this patent subsequent to Jul. 12, 2000, has been disclaimed.

Int. Cl.³ C07C *103/153*

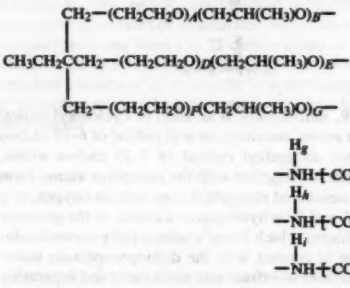
U.S. Cl. 564—153 **4 Claims**

1. A compound of the formula

$$O[(CH_2CH_2O)_A(CH_2CH(CH_3)O)_BCH_2CH(CH_3)NH(COC(CH_3)=CH_2)]_2$$

wherein A+B has an average value of about 2 to about 45.

2. A mixture of compounds of the formula



wherein (A+B+D+E+F+G) has an average value of about 6 to about 35; A, B, D, E, F, G are all greater than or equal to 1; x, y, z are 0 or 1; provided if x=0, g is 1 and conversely g is 0 if x=1; if y=0, h is 1 and conversely h is 0 if y=1; if z=0, i is 1 and conversely i is 0 if z=1; provided further, at least one of x, y, z must be 1.

4,536,601

OPTICALLY ACTIVE N-SUBSTITUTED PHENYLALANINOLS AND USE THEREOF

Masatoshi Tukamoto, Settsu, and Tadahiro Sawayama, Kawanishi, both of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

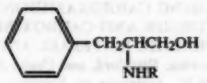
Filed Sep. 23, 1983, Ser. No. 535,284

Claims priority, application Japan, Sep. 28, 1982, 57-172179; Sep. 28, 1982, 57-172180

Int. Cl.³ C07C *91/02; C07D 317/44*

U.S. Cl. 564—355 **3 Claims**

1. An optically active N-substituted phenylalaninol of the formula:



wherein R is isopropyl, 1-ethylpropyl, cyclopentyl, cyclohexyl, cycloheptyl, 4-methylbenzyl, 4-methoxybenzyl, or 3,4-methylenedioxybenzyl, or an acid addition salt thereof.

2. The optically active N-substituted phenylalaninol of claim 1 wherein R is isopropyl.

4,536,602

AMINATION OF OLEFINS USING ORGANIC ACID CATALYSTS

Michael Deeba, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 1, 1984, Ser. No. 616,359
Int. Cl.[3] C07C *85/02, 85/18*
U.S. Cl. 564—485 11 Claims

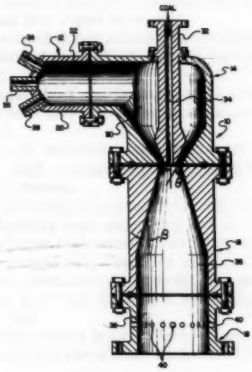
1. A process for forming an amine which comprises: reacting ammonia, a primary amine, or a secondary amine with an olefin, under conditions effective for forming said amine, in the presence of an effective amount of an organic acid catalyst wherein said organic acid catalyst is perfluorinated and has a Hammett acidity value no greater than about −10.

4,536,603

PRODUCTION OF ACETYLENE FROM COAL BY CONTACT WITH A COMBUSTION GAS

Kenneth M. Sprouse, Northridge; Merlin D. Schuman, Canoga Park, and L. Paul Combs, Woodland Hills, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 22, 1983, Ser. No. 564,643
Int. Cl.[3] C10B *49/02, 49/08;* C10G *1/00*
U.S. Cl. 585—539 25 Claims



1. A process for producing acetylene from coal comprising the sequential steps of:

(a) introducing carbonaceous a fuel, oxygen and steam into a hot gas generation zone, the oxygen being introduced in an amount less than the stoichiometric amount required to react with all of the fuel;

(b) reacting the fuel, oxygen and steam within the hot gas generation zone at a superatmospheric pressure and a temperature within the range of from about 3000° to 4500° F. (1920° to 2760° K.) to produce a hot gas stream principally comprising hydrogen, carbon monoxide and steam along with minor amounts of carbon dioxide, and controlling the temperature within said range such that the hot gas stream is essentially free of O, OH and O_2;

(c) accelerating the hot gas stream to a velocity within the range of from about 500 to 4,000 feet per second (150 to 1220 meters per second) and introducing it into a coal reaction zone;

(d) introducing a stream of particulate coal into said coal reaction zone, said coal being selected from the group consisting of bituminous and subbituminous coals, and having a median particle size of less than about 100 microns;

(e) impinging said particulate coal and hot gas stream upon one another to cause intimate mixing and rapid reaction of said stream of particulate coal with said hot gas stream to form an entrained flow of particulate coal in said hot gas, decelerating said flow to a velocity of from about 150 to 300 ft/sec (46 to 92 meters per second), and controlling the amounts of said stream of particulate coal and said hot gas stream to produce in said reaction zone a pressure in the range of from about 10 to 100 psia (0.7 to 6.8 atm.) and a temperature of from about 1800° to 3000° F. (1260° to 1920° K.);

(f) maintaining the mixture of coal and hot gas at said pressure and temperature for a time of from about 2 to 30 milliseconds to produce a product stream, said product stream including enhanced yields of acetylene along with other reaction products and char;

(g) reducing the temperature of said product stream to less than about 900° F. (750° K.) in a time of less than about 2 milliseconds to substantially arrest any further reactions;

(h) separately recovering said acetylene and char; and

(i) utilizing said char as the source of at least a part of the fuel introduced into said hot gas generation zone.

4,536,604

BUTADIENE REDUCTIVE DIMERIZATION USING A PLATINUM CATALYST AND POLYMERIC AMINE PROMOTER

Jiang-Jen Lin, Round Rock, and David C. Alexander, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 15, 1984, Ser. No. 589,805
Int. Cl.[3] C07C *2/76, 11/00*
U.S. Cl. 585—601 18 Claims

1. A method for the preparation of 1,6-octadiene comprising reacting 1,3-butadiene with formic acid in the presence of a platinum(II) catalyst and a polymeric tertiary amine promoter.

4,536,605

PROCESS FOR THE PRODUCTION OF TERTIARY OLEFIN

Koichi Kida, Toyosaka; Yoshio Kawai, Niigata; Yutaka Tamura, Niigata, and Yoshiharu Suzuki, Niigata, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 280,071, Jul. 2, 1981, Pat. No. 4,343,959. This application Apr. 23, 1982, Ser. No. 371,424
Claims priority, application Japan, Jul. 25, 1980, 55-102074; Jan. 14, 1982, 57-4325
Int. Cl.[3] C07C *1/00*
U.S. Cl. 585—640 14 Claims

1. A process for producing the corresponding tertiary olefin from a tertiary ether which comprises contacting in the presence of steam a gaseous tertiary ether with a catalyst obtained by calcining a silica-alumina compound at 700°–1100° C., the molar ratio of steam to tertiary ether being from 0.3 to 50.

4,536,606

CONTROL OF A CRACKING FURNACE

James W. Hobbs, Sweeny, Tex., assignor to Phillips Petroleum Company, Baruesville, Okla.

Filed Mar. 10, 1981, Ser. No. 242,491
Int. Cl.[3] C07C *4/02;* G01N *31/00;* G06F *7/58*
U.S. Cl. 585—650 11 Claims

1. A method for controlling a cracking furnace in which a feed stream is cracked to produce a gaseous mixture which contains both components which were originally in said feed stream and components which are produced by the cracking of the original components in said feed stream, said method comprising the steps of:

(a) analyzing said feed stream to determine the concentration (X2) of a first component in said feed stream;

(b) analyzing said gaseous mixture to determine the concentration (Z2) of said first component in said gaseous mixture;

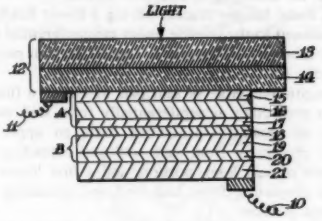
(c) estimating the conversion (Y2) of said first component in said cracking furnace;
(d) calculating the expansion (A2) of said first component in said cracking furnace based on the value of Y2 and expansion versus conversion data
(e) calculating the expansion (A) of said feed stream in said cracking furnace based on the value of X2 and A2;
(f) calculating the conversion (Y2E) of said first component based on the value of A, X2 and Z2;
(g) calculating a new estimated conversion of said first component based on the value of Y2 and Y2E and establishing a first signal representative of the new estimated conversion;
(h) establishing a second signal representative of the desired conversion of said first component;
(i) comparing said first signal and said second signal and establishing a third signal which is responsive to the difference between said first signal and said second signal; and
(j) manipulating the heat supplied to said cracking furnace in response to said third signal to thereby maintain said first signal substantially equal to said second signal.

4,536,607

PHOTOVOLTAIC TANDEM CELL

Harold J. Wiesmann, 1662 Roland Ave., Wantagh, N.Y. 11793

Filed Mar. 1, 1984, Ser. No. 585,159
Int. Cl.[3] H01L *31/06*
U.S. Cl. 136—249 38 Claims



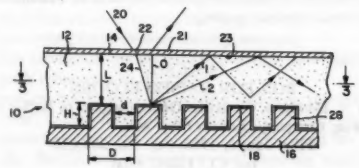
1. A photovoltaic tandem cell wherein the cells are electrically in series with each other comprising, from top to bottom:
an electrically conducting superstrate;
a first cell comprising layers (a), (b), and (c), wherein:
(a) is a first doped amorphous semiconductor layer of a first conductivity type underlying and in contact with said superstrate,
(b) is an intrinsic amorphous semiconductor layer underlying said first doped layer, and
(c) is a second doped amorphous semiconductor layer of said second conductivity type underlying said intrinsic layer;
a non-opaque, high conductivity layer underlying and in contact with said second doped amorphous semiconductor layer;
a second cell underlying and in contact with said non-opaque, high conductivity layer, comprising layers (d) and (e), wherein:
(d) is a first polycrystalline semiconductor layer of a first conductivity type underlying and in contact with said non-opaque high conductivity layer, and
(e) is a second polycrystalline semiconductor layer of a second conductivity type underlying said first polycrystalline layer and forming a p-n heterojunction therewith; and
an electrical contact layer underlying and in contact with said second polycrystalline semiconductor layer.

4,536,608

SOLAR CELL WITH TWO-DIMENSIONAL HEXAGONAL REFLECTING DIFFRACTION GRATING

Ping Sheng, Skillman, and Aaron N. Bloch, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 25, 1983, Ser. No. 488,436
Int. Cl.[3] H01L *31/04*
U.S. Cl. 136—259 7 Claims



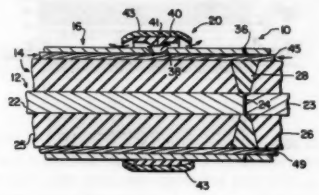
1. A solar cell comprising:
(a) an active layer of semiconductor material having a pair of opposed surfaces,
(b) a two dimensional diffraction grating fixed to one of said surfaces of said active layer and coated with a layer of reflecting material at the interface between said grating and said active material, said grating being a hexagonal array of a plurality of protrusions or depressions wherein said protrusions or depressions are of cylindrical shape such that the distance between the circular cross-sectional centers of said cylindrical shapes is the same between any two adjacent cylindrical shapes.

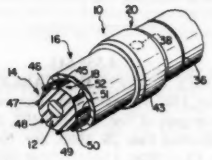
4,536,609

OIL WELL ELECTRICAL CABLE WITH GAS CONDUCTING CHANNEL AND VENT

David H. Neuroth, Bethany, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jul. 6, 1983, Ser. No. 511,143
Int. Cl.[3] H01B *7/18*
U.S. Cl. 174—11 R 21 Claims





10. An oil well electrical cable comprising:
a conductor;
a layer of gas-permeable insulation surrounding the conductor;
a low gas-permeable sheath surrounding the insulation;
channel means, extending longitudinally of the cable inside the sheath, for defining a gas-permeable channel to conduct, longitudinally of the cable, gases located in the insulation;
said channel means comprising an elongated member having a greater gas permeability than said insulation; and
vent means, in communication with said channel means, for venting gases conducted along said channel means through the sheath to the exterior thereof.

4,536,610

OIL-FILLED, MULTI-CORE CABLE WITH AT LEAST ONE CONDUCTOR DIFFERING FROM OTHERS

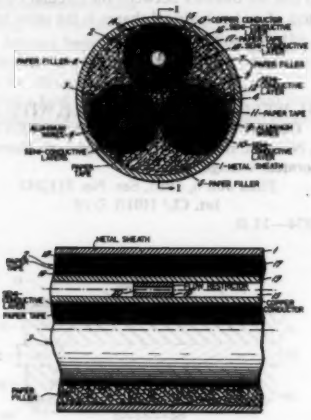
Alberto Giussani, Milan, Italy, assignor to Societa' Cavi Pirelli, S.p.A., Milan, Italy

Filed Jun. 18, 1984, Ser. No. 621,442
Claims priority, application Italy, Jun. 21, 1983, 21700 A/83
Int. Cl.[3] H01B *9/06*
U.S. Cl. 174—26 R 10 Claims

1. An oil-filled, multi-core, electric cable comprising a metal sheath surrounding a plurality of cores, each of said cores comprising a metal conductor covered with oil-permeable insulation impregnated with a fluid, insulating oil, the conductor of at least one, but less than all, of said cores being made of a metal having an electrical conductivity higher than the elec-

479-974 O.G.-85-13

trical conductivity of the metal of the conductor of at least one other of said cores, each conductor made of a metal of higher conductivity having a longitudinal duct therein for the move-



ment of said fluid, insulating oil along the duct and each conductor made of a metal of a lower conductivity being a compact strand of metal wires which substantially fill the space within a circle containing the periphery of said strand.

4,536,611

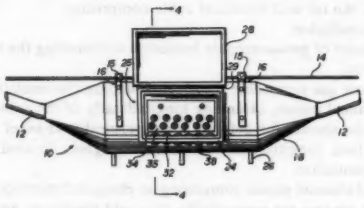
UNITARY TELEPHONE CABLE CLOSURE

David O. Butler, 1306 Vermont Ave., Tarpon Springs, Fla. 33589

Continuation-in-part of Ser. No. 623,495, Jun. 22, 1984,. This application Feb. 28, 1985, Ser. No. 706,860

Int. Cl.³ H02G *15/113, 7/08;* H01R *9/00*

U.S. Cl. 174—41 **10 Claims**



1. A unitary telephone cable closure for enclosing a communications cable suspended from a support strand, comprising:

a hollow, flexible wall, tubular housing having a pair of longitudinal mating edges separated by a longitudinal access slot, said edges being fastenable together in mating engagement after passing a cable through said slot;

a metal hanger bracket having a lower flexible portion fastened to the outside upper circumferential surface of said tubular housing and a vertical portion projecting upwardly, for fastening to a support strand;

a second metal hanger bracket having a lower flexible portion fastened to the outside upper circumferential surface of said tubular housing and a vertical portion projecting upwardly, for fastening to a support strand;

a first longitudinal edge of said pair including a first hook portion projecting circumferentially from said wall and having an upwardly projecting barb, an upper guard portion projecting from said wall and extending above said barb of said hook portion, and a first lower guard portion projecting from said wall and extending below said hook portion;

a second longitudinal edge of said pair including a second hook portion projecting circumferentially from said wall and having a downwardly projecting barb and a second lower guard portion projecting from said wall and extending below said second hook portion;

said second hook portion of said second edge disposed for mating engagement between said upper guard portion and said first hook portion of said first edge, and said second lower guard portion of said second edge disposed for mating engagement between said first hook portion and said first lower guard portion of said first edge;

whereby said first and second hook portions are protected by both said first and said second lower guard portions;

whereby said closure can be fastened about a cable.

6. A unitary telephone cable closure for enclosing a communications cable suspended from a support strand, comprising:

a hollow, flexible wall, tubular housing having a pair of longitudinal mating edges separated by a longitudinal access slot, said edges being fastenable together in mating engagement after passing a cable through said slot;

a metal hanger bracket having a lower flexible portion fastened to the outside upper circumferential surface of said tubular housing and a vertical portion projecting upwardly, for fastening to a support strand;

a second metal hanger bracket having a lower flexible portion fastened to the outside upper circumferential surface of said tubular housing and a vertical portion projecting upwardly, for fastening to a support strand;

a rectangular frame formed about a rectangular opening in one side of said tubular housing between said first and said second metal brackets;

a terminal block panel assembly attached within said rectangular frame and being comprised of a terminal block panel on which a terminal block is mounted;

a hinge mounted horizontally on a top side of said frame;

a rectangular lid pivotally mounted on said hinge, for providing access to said terminal block;

whereby said closure can be fastened about a cable and access can be had to terminate portions of a cable through said rectangular opening.

4,536,612

BOX FOR RAISED FLOORS

Charles N. Domigan, Coolville, Ohio, assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Jun. 3, 1983, Ser. No. 500,620

Int. Cl.³ H02G *3/08*

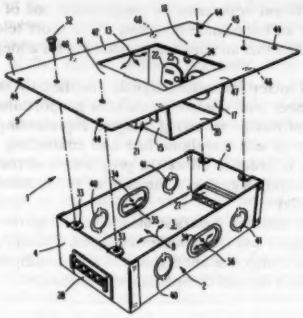
U.S. Cl. 174—48 **8 Claims**

6. A floor box comprising:

a hollow housing having a top opening; and

divider means connected with said housing and forming, in conjunction with the housing, a pair of spaced apart power sections with each section having a receptacle bracket, a communication section partially formed by said

receptacle brackets and being open to said top opening, and a passageway underneath the communication section



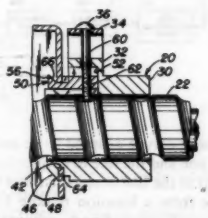
and providing space for conductors to extend between the power sections.

4,536,613

CLAMP BUSHING FOR SECURING AN ELECTRICAL CABLE TO AN ELECTRICAL OUTLET BOX

Gunter A. Gallas, New Hyde Park, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,475
Int. Cl.³ H05K 5/02
U.S. Cl. 174—65 R **10 Claims**



1. A clamp for securing an electrical distribution member such as an electrical power cable, electrical metallic tubing and the like to a junction box, comprising:

a bushing member adapted to receive the distribution member to be secured to the box;

a pair of jaws extending from said bushing, said jaws adapted to be inserted within a cable entry port in a wall of the box, one of said jaws being formed on an arm which is movable relative to said bushing member, and the other jaw being fixed to said bushing member;

guide means for guiding said arm during movement along a path transverse to the cable;

actuation means both for moving said jaws relative to each other to permit said jaws to grip the cable entry port along generally opposite rim portions thereof and for securing the distribution member to said bushing member, said actuating means including a threaded fastener threadably engaging said arm for moving said arm along said transverse path when said threaded fastener is turned, said threaded fastener having a head and a threaded shank; and

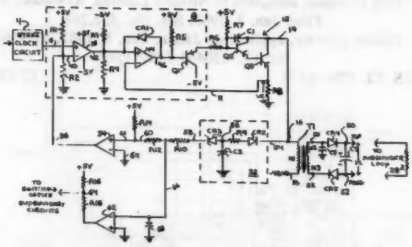
biasing means associated with said bushing, said biasing means adapted to urge said movable arm away from said fixed jaw.

4,536,614

SUPERVISION AND DIAL PULSE DETECTION CIRCUIT FOR A TELEPHONE SUBSCRIBER LINE

Constantine V. Skidanenko, Menlo Park, and Gregor D. McGibbon, San Carlos, both of Calif., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 13, 1982, Ser. No. 449,030
Int. Cl.³ H04M 3/22
U.S. Cl. 179—18 FA **3 Claims**



1. In a floating battery feed circuit for providing a controlled current to a telephone station set of a subscriber loop, supervisory and dial pulse detection apparatus comprising:

a primary dc power source having positive and negative output terminals, said positive output terminal being connected to ground;

a transformer having a primary and a secondary winding, one terminal end of said primary winding being connected to said negative output terminal of said primary dc power source;

a rectifier circuit, including a first storage capacitor, connected between first and second terminals of said secondary winding, the output of said rectifier circuit being adapted for connection to the tip and ring leads of said subscriber loop;

a clock source providing clock signals at predetermined time intevals at an output;

a pulse width control circuit having a first input receiving said clock signal and in response thereto providing a drive signal at an output thereof, and having a second input adapted to receive a feedback control signal;

a transistor circuit configuration having a first input connected to the other terminal end of said primary winding, and having a second input receiving said drive signal and in response thereto switching from an off to a saturation condition, and providing said feedback control signal to the second input of said pulse width control circuit so as to turn off the drive signal when the amplitude of said feedback control signal reaches a predetermined value, whereby energy is transferred from the primary of said transformer to the secondary, and reflected energy is transferred from the secondary winding to said primary winding; and

means responsive to the reflected voltage from said secondary winding for identifying the telephone station set that is on-hook or off-hook;

said identifying means comprising means for establishing a threshold voltage level above which an on-hook condition is identified and below which an off-hook condition is identified; and comparing means responsive to the output of said threshold level means whereby status of the subscriber loop is supplied to a local switching office; and

said means for establishing a threshold voltage level comprising a peak detector having one input terminal connected to the other terminal end of said primary winding and including a second storage capacitor for storing the reflected voltage; and a voltage breakdown diode having an anode which is connected to one terminal end of said second storage capacitor to provide the desired threshold

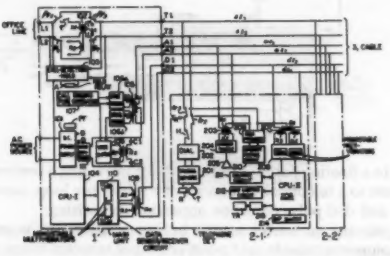
level and thus establish the identification of on-hook or off-hook states, which results from the different voltage levels being reflected from the secondary winding to the primary winding.

4,536,615

KEY TELEPHONE EQUIPMENT AND ASSOCIATED METHOD

Norio Kimijima, Nagatsuta, and Yuzuru Kawazoe, Kawasaki, both of Japan, assignors to Nitsuko Limited, Kawasaki, Japan

Filed Jan. 3, 1983, Ser. No. 455,264
Claims priority, application Japan, Jun. 5, 1982, 57-95605
Int. Cl.³ H04M *1/60, 9/06*
U.S. Cl. 179—81 B **17 Claims**



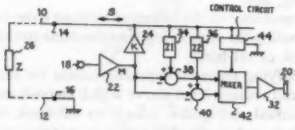
16. A method of connecting a main unit of telephone equipment to a plurality of telephone sets for connection of the telephone sets to an external office line and for extension line calling, said method comprising operatively connecting the main unit to an external office line, operatively connecting the plurality of telephone sets to the main unit in parallel via three pairs of wires constituted by a first pair of line wires, a second pair of audio signal wires and a third pair of data signal wires, and supplying electrical voltage from an external source through the main unit to each of the telephone sets via the pairs of data wires and audio wires enabling extension line calling to be completed through said pair of audio signal wires and said pair of data signal wires whereas outside calling through the external office line is effected through the the line wires and the main unit.

4,536,616

MICROPHONE OR MOUTHPIECE SIGNAL SUPPRESSION CIRCUIT

Jean C. Kaire, St. Egreve, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 28, 1983, Ser. No. 566,434
Claims priority, application France, Dec. 28, 1982, 82 21865
Int. Cl.³ H04M *1/58*
U.S. Cl. 179—81 A **8 Claims**



1. A mouthpiece signal suppression circuit for a telephone set, which telephone set includes a mouthpiece amplifier supplying a mouthpiece signal to a line amplifier, which transmits this mouthpiece signal on a telephone line, a receiver amplifier supplying a signal to a receiver with the mouthpiece signal suppression circuit receiving on the one hand the mouthpiece signal and on the other hand a composite signal from the line, in order to supply the telephone receiver with a signal essentially corresponding to the composite signal, from which has been subtracted the mouthpiece signal, wherein said suppression circuit comprises:

two different compensation impedances, one of which provides an impedance matching for a short telephone line and the other an impedance matching for a long telephone line,

a signal mixer for mixing signals modified by said two impedances with controlled variable proportions,

a control circuit receiving a signal representing the impedance of said telephone line and controlling said signal mixer in order to check the proportions of the mixture of said mixing signal as a function of the impedance of said line, and

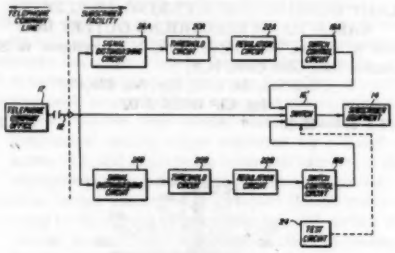
a signed addition function means receiving the composite line signal and the mouthpiece signal wherein at least one of said composite line signal and said mouthpiece signal is modified by said compensation impedances.

4,536,617

REMOTELY-ACTIVATED SWITCHING APPARATUS

Steven B. Perry, Highlands, N.J., assignor to Keptel, Inc., Ocean, N.J.

Filed Aug. 1, 1983, Ser. No. 519,411
Int. Cl.³ H04B *3/46*
U.S. Cl. 179—81 R **30 Claims**



27. A switching deivce adapted to be coupled to a line such as a telephone line and the like to connect or disconnect equipment connected to the line in response to a first signal transmitted on the line from a location remote from the location at which the device is located and reconnect the equipment in response to a second signal transmitted on said telephone line from said remote location, the device comprising switch means coupled to the line and to the equipment so as to connect and disconnect the line and the equipment in respective switching states of the switch means, first means coupled to the line and to the switch means responsive to the first signal when on the line to cause the switch means to switch from a first state connecting the equipment to a second state disconnecting the equipment from the line, second means substantially the same as and separate from the first means responsive to the second signal when on the line and coupled to the switch means for causing the switch means to switch from the second state to the first state, said first means comprising a first voltage threshold means which provides an output voltage causing the switch means to switch only when the voltage at the input of the first voltage threshold means exceeds a predetermined value, said second means comprising a second voltage threshold means which provides an output voltage causing the switch means to switch only when the voltage at the input of the second voltage threshold means exceeds a predetermined voltage of a polarity opposite to the polarity of the voltage at the input to the first voltage threshold means which is effective to cause switching, said first means further including a first voltage regulator coupled to the first voltage threshold means and said second means comprising a second voltage regulator coupled

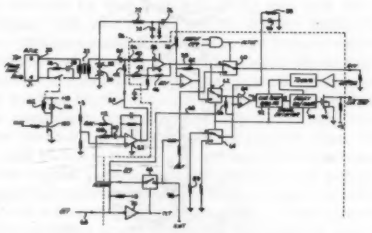
to the second voltage threshold means, said device further including first chargeable means coupled to the output of the first voltage regulator adapted to charge when there is a voltage present at the output of the first voltage regulator, second chargeable means coupled to the output of the second voltage regulator adapted to charge when there is a voltage present at the output of the second voltage regulator, first discharge means coupled to the first chargeable means for discharging the first chargeable means when the magnitude of the voltage at the first chargeable means exceeds the magnitude of the voltage at the output of the first voltage regulator, second discharge means coupled to the second chargeable means for discharging the second chargeable means when the magnitude of the voltage at the second chargeable means exceeds the magnitude of the voltage at the output of the second voltage regulator, the first discharge means being coupled to the switch means and controlling switching of the switch means from the first state to the second state when the first discharge means id discharging, the second discharge means being coupled to the switch means and controlling switching of the switch means from the second state to the first state when the second discharge means is discharging.

4,536,618

TELEPHONE LINE INTERFACE

Arthur L. Serrano, Canoga Park, Calif., assignor to Novation, Inc., Chatsworth, Calif.

Filed Oct. 14, 1983, Ser. No. 541,986
Int. Cl.³ H04M *1/72*
U.S. Cl. 179—84 R **8 Claims**



1. Apparatus for detecting the ring signal on first and second telephone lines comprising;

a coupling transformer having a primary winding and a secondary winding, each having at least two leads thereon,

a switch means for controllably changing between open and closed conditions to provide electrical conduction between first and second switch contact means when in said closed condition, said first switch contact means being a means for connection to the first telephone line, said second switch contact means being coupled to said first primary lead for said coupling transformer, said second primary lead of said coupling transformer including means for coupling to the second telephone line,

open line load means coupled between said first and second switch contact means for providing a predetermined linear load on the phone lines when said switch means is open, and

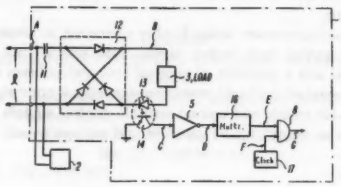
ring signal sensing means coupled to said first and second secondary leads of said coupling transformer for sensing the presence of a ring signal on the telephone lines when said switch means is open, said ring signal sensing means including filter means for attenuating signals not within the predetermined frequency range of the ring signal, and sensing means coupled to said filter means for sensing the presence of an output of said filter means within the predetermined frequency range of the ring signal and providing a ring detect output signal in response thereto.

4,536,619

RINGING SIGNAL DETECTION CIRCUIT

Fumikazu Hamatani, and Kouichi Funabasama, both of Kawasaki, Japan, assignors to Nitsuko Limited, Kawasaki, Japan

Filed Dec. 27, 1983, Ser. No. 565,629
Claims priority, application Japan, Dec. 28, 1982, 57-227728
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—84 R **8 Claims**



1. A ringing signal detection circuit for a subscriber's apparatus connected to a telephone office line together with a telephone set having a rotary dialling device for sending out a dial pulse signal, which comprises;

first means receiving an incoming signal on the telephone office line and producing a pulse signal with a repetition frequency twice that of the incoming signal:

second means coupled to an output of said first means and providing a high level signal at an output thereof in response to each pulse from said first means, said second means maintaining the high level signal continuously during a time period when pulses are applied thereto with a pulse interval smaller than a predetermined break period in the dial pulse signal; and

third means for detecting a time period during which the output of said second means is maintained at a high level, said third means providing a ringing signal detection output at a time when the detected time period is equal to a predetermined time period in relation to the ringing signal,

said third means comprising:

clock pulse generator means for generating clock pulses at a predetermined repetition frequency higher than the dial pulse signal;

fourth means coupled with the output of said second means and said clock pulse generator means for permitting the clock pulses to pass therethrough during a time period when the output signal from said second means is maintained at the high level; and

counter means coupled with an output of said third means and counting up the clock pulses passing through said fourth means, said counter means providing the ringing signal detection output at a time when a counter number in said counter means is equal to a value predetermined in relation to the ringing signal.

4,536,620

MASTER UNLOCK CIRCUIT FOR AN ELECTRONIC TELEPHONE

John G. Wagoner, Vienna, Va., and Louis W. Smith, St. Petersburg, Fla., assignors to GTE Business Communication Systems Inc., Northlake, Ill.

Filed Dec. 12, 1983, Ser. No. 560,694
Int. Cl.³ H04M *1/26*
U.S. Cl. 179—90 D **9 Claims**

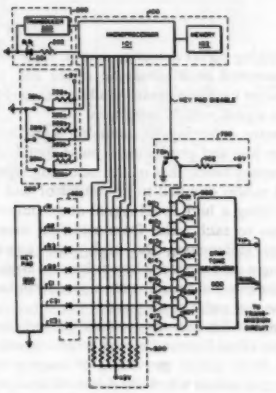
1. A master unlock circuit for use in a telephone station which includes a keypad operative to provide a plurality of pairs of row and column signals, a tone generator operative to provide a plurality of pairs of tones, and a station lock switch operative to provide a station lock switch signal, said master unlock circuit comprising:

storage means operative to provide a stored lock status

signal, a stored unlock status signal and a stored master unlock code signal, each in response to a lock status signal, unlock status signal or master unlock code signal, respectively, being stored in said storage means;

a microprocessor connected to said station lock switch, said keypad and said storage means and operative in response to said station lock switch signal and said stored unlock status signal to provide disable and first sensible control signals and to store a lock status signal in said storage means;

said microprocessor being further operative in response to said station lock switch signal, said stored lock status signal and a plurality of pairs of row and column signals representative of said stored master unlock code signal to provide enable and second sensible control signals and to store an unlock status signal in said storage means;



gating means coupled between said microprocessor and said tone generator and further coupled between said keypad and said tone generator, said gating means being operative in response to said enable signal and said pairs of row and column signals to provide gate signals representative of said pairs of row and column signals, and further operative in response to said disable signal to inhibit said gate signals;

said tone generator being operative in response to said gate signals to provide an associated pair of tones; and

first sensible indication means connected to said microprocessor and operative in response to said first sensible control signal to provide a first sensible signal, and further operative in response to said second sensible control signal to provide a second sensible signal.

4,536,621

DUAL TALK PATH KEY TELEPHONE

Henry M. Bergen, Floral Park; Sedat Zaimi, New York; Vincenzo Castellano, Brooklyn, and Irwin Schildkraut, New York, all of N.Y., assignors to IPC Communications, Ltd., Greenwich, Conn.

Filed May 8, 1984, Ser. No. 608,239

Int. Cl.³ H04M *1/02, 1/72*

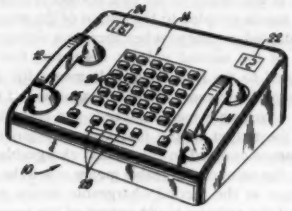
U.S. Cl. 179—99 R **3 Claims**

1. In a multi-line key telephone system the combination of:

a key field including a plurality of non-locking pushbutton keys for selected line connections;

at least two independent audio terminations;

means for coupling said key field to control line selection for a particular audio termination only for a predetermined interval after a new line request therefor; and



switching means for coupling said audio terminations to a selected line if selected during said predetermined interval following a new line request.

4,536,622

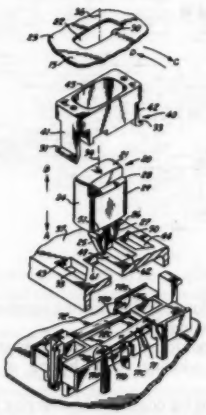
REMOTE TELEPHONE ON-HOOK, OFF-HOOK CONTROL AND INDICATION CIRCUIT

Richard F. Rieman, Lawrence Township, Marion County, Ind., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Sep. 29, 1982, Ser. No. 426,359

Int. Cl.³ H01H *9/22;* **H04M** *1/03*

U.S. Cl. 179—103 **1 Claim**



1. A telephone handset comprising: a handset housing containing a transmitter and a receiver and having a dial mounted on its front side on a front enclosure wall for said housing, said wall having formed therein an aperture communicating with the interior of said housing and having an aperture axis passing through said aperture transverse to said wall, a chassis disposed in said housing in fixed relation therewith so as to be beneath and spaced from said aperture, said chassis having formed therein a pair of slots, a frame disposed in said housing between said aperture and chassis and having formed therein a guideway extending in the direction of the aperture-chassis spacing, a pair of clips joined to said frame and extending from said frame through said slots, said clips terminating away from said frame in respective tabs facing toward the side of said chassis away from said frame and each adapted to make engagement with such side, and said clips being dimensioned and unlocked in said slots to allow said frame to be angularly rockable relative to said chassis and housing in the direction towards and away from said transmitter, a push button received in said aperture so that the front and back ends of said

button are, respectively, outside and inside said housing, said button having a button axis extending between said ends and a body portion disposed intermediate said ends and received with a sliding fit in said guideway, and said button having formed in its front end and on a side thereof in the direction towards or away from said transmitter a recessed knee of "L" shape in cross-section in such direction so as to be bounded by first and second button surfaces substantially normal to each other, and of which said first surface extends inward from said side to form a lip on said button, and said second surface extends from the inner edge of said first surface in the axial direction of said button to the top of said button at its front end, a compression spring interposed between said chassis and a rearward part of said push button so as to urge said button outwardly, a stop formed on said button and adapted by engagement with said frame to communicate thereto such urging of said spring, said button and frame being adapted by manipulation of said button to be movable together between a reference angular position at which said button and aperture axes are parallel and said button is slidably movable in said frame between innerpost and outermost operating positions and, on the other hand, a displaced angular position at which said button and aperture axis are at an acute angle and said lip is beneath a portion of said wall adjacent said aperture, said spring being adapted when said button and frame are at such displaced angular position to displace such button translationally outward so as to bring said lip into friction contact with such wall portion and, thereafter and by such friction contact, to yieldably maintain said button and frame in said displaced angular position against the bias of a resilient force produced by said spring, said spring button and frame being further adapted, when said button and frame are at said reference angular position, to operate so that said frame and chips are driven outward by said urging to bring said tabs into said engagement with said chassis side to thereby stabilize said frame to yieldably maintain said button and frame at said reference angular position while permitting angular displacement of said button and frame away from such position against the bias of said resilient force produced by said spring; said handset further comprising, switch means disposed in said housing adjacent the back end of said button and adapted when, respectively, said button is in either of said innermost operating and displaced angular positions and, alternatively, said button is in said outermost operating position, to be actuated by said back end of said button to assume, respectively, a first open condition corresponding to an ON-HOOK condition for said handset, and a second close condition corresponding to an OFF-HOOK condition for said handset.

4,536,623

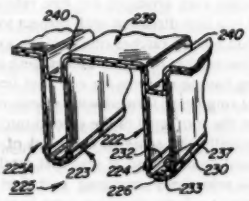
ELECTRO-ACOUSTIC TRANSDUCER WITH DIAPHRAGM AND BLANK THEREFOR

David A. Larson, 2460 Wisconsin Ave., Downers Grove, Ill. 60515

Division of Ser. No. 389,423, Jun. 16, 1983,. This application Oct. 13, 1983, Ser. No. 503,947

Int. Cl.³ H04R *9/00, 7/14*

U.S. Cl. 179—115 R **10 Claims**



1. In an electro-acoustic transducer having spaced-apart magnet means, a diaphragm comprising a folded sheet of film material having a front surface and having a plurality of spaced-apart elongated projections extending from the back side thereof and being channel-shaped throughout their lengths, each one of said projections having conductor means disposed thereon and extending substantially in alignment with said magnet means to coact electromagnetically therewith; a substantially flat, thin sheet secured in overlying relationship with said front surface; and wherein a series of pairs of inward extending gussets are formed in said leg portions and contact one another.

4,536,624

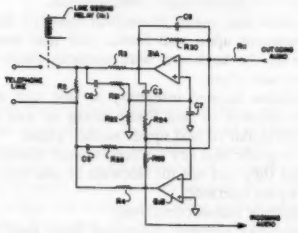
TELEPHONE ANSWERING MACHINE INTERFACE CIRCUIT

Stephen V. Lyle, San Pedro, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.

Filed Jan. 13, 1983, Ser. No. 457,663

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—170 NC **5 Claims**



1. A circuit for interfacing a telephone answering machine to a telephone line, including: a transmit amplifier circuit for audio signals to be introduced to the telephone line and including first and second differential amplifiers; circuitry for connecting the output of said amplifier circuit to the telephone line including an output circuit connected to said differential amplifiers to provide a balanced output between the outputs of said differential amplifiers; a resistor of a selected resistance value included in said circuitry adapted to be connected across said telephone line to provide a direct current terminating impedance for the telephone line; and a positive feedback circuit connected to said transmit amplifier circuit to enable said transmit amplifier circuit to increase the effective impedance of said resistor to an increased apparent alternating current impedance in the presence of audio signals.

4,536,625

KEYBOARD DESIGN

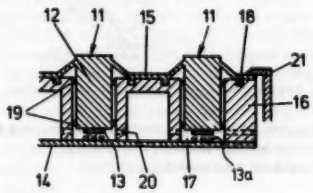
Alain M. Bebie, Germaniastr. 51, 8006, Zurich, Switzerland

Filed Apr. 13, 1984, Ser. No. 599,801

Claims priority, application Switzerland, Apr. 20, 1983, 2105/83; Oct. 11, 1983, 5521/83; Nov. 14, 1983, 6100/83

Int. Cl.³ H01H *13/70*

U.S. Cl. 200—5 A **24 Claims**



1. An electrical switch keyboard comprising:

a frame defining an upper surface plane,
a one-piece mat made of resilient material laid in sealing engagement upon said frame, said mat being an upper layer of the keyboard with portions thereof positioned above said plane,
key portions formed integrally in said mat structured to move relative to said frame along a designated axis angled relative to said upper surface plane,
means in part integrally depending below said mat from said key portions to guide said key portions in said relative movement to said frame so that they can not appreciably tilt sidewise of said designated axis upon actuation by an operator for movement along said designated axis, and
switching elements positioned within said frame to operate in conjunction with said key portions,
each of said key portions having an operation element to function with said switching elements to produce switching currents upon depression of the respective key portion.

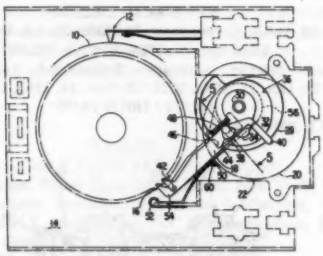
2. An electrical switch keyboard comprising:
a frame defining an upper surface plane,
a one-piece mat made of resilient material laid in sealing engagement upon said frame, said mat being an upper layer of the keyboard with portions thereof positioned above said plane,
key portions formed integrally in said mat structured to move relative to said frame along an axis substantially perpendicular to said upper surface plane,
means to guide said key portions in said relative movement so that they can not tilt sidewise of said axis upon actuation by an operator,
said guidance means comprising
a piston-like element depending from each key portion and
a structure in said frame which provides a slide track for said piston-like element to a switching position,
switching elements positioned within said frame to operate in conjunction with said key portions,
each said piston element having an operation member depending therefrom to function with said switching elements to produce switching currents upon depression of the respective key portion.

4,536,626

TIMER DRIVE MECHANISM

Guy A. Wojtanek, Franklin Park, Ill., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 1, 1984, Ser. No. 616,092
Int. Cl.[3] H01H *43/00*; G04F *8/00*
U.S. Cl. 200—35 R **9 Claims**



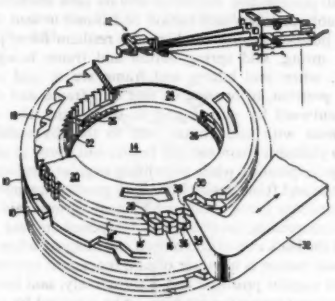
1. A mechanism for driving a switching device in a timer or the like in a step-by-step manner, comprising:
a ratchet track on said switching device;
a motor;
a drive cam coupled to said motor for continuous rotation therewith, said drive cam having opposed first and second camming surfaces thereon;
a drive pawl operatively associated with said ratchet track;
a cam follower mounted on said drive pawl and trapped between said first and second camming surfaces;
means for yieldably biasing said drive pawl against said ratchet track; and
guide means for limiting the motion of said drive pawl to substantially linear reciprocation tangential to said ratchet track.

4,536,627

EXPANDED INTERVAL TIMER DRIVE MECHANISM

John P. Duve, Brookfield, Ill., assignor to The Singer Company, Conn.

Filed Jun. 1, 1984, Ser. No. 616,032
Int. Cl.[3] H01H *43/00*
U.S. Cl. 200—38 R **9 Claims**

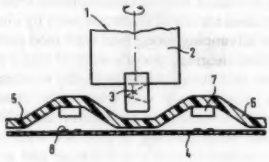


1. A program timer having a plurality of timing cams located on a rotating member and controlling the operation of switches in a predetermined program characterized by:
a first ratchet ring mounted on said rotating member for movement therewith, said first ratchet ring having a first band of ratchet teeth over a first portion of its width and a second band of ratchet teeth over the remainder of its width, the ratchet teeth of said first band having uniform root and tip levels, said second band having at least one region with no ratchet teeth and being at a level below the root level of the ratchet teeth of said first band, the remainder of said second band having ratchet teeth which are coextensive with the ratchet teeth of said first band;
a second ratchet ring arranged for free relative rotational movement in a first direction with respect to said rotating member, said second ratchet ring being in axial alignment with said first ratchet ring, the ratchet teeth of said second ratchet ring having uniform tip and root levels, said second ratchet ring being formed with at least one notch at a level below the root level of the second ratchet ring teeth and substantially the same as the level of the toothless region of said second band of said first ratchet ring; and
a drive pawl selectively engaging said first and second ratchet rings to selectively drive same in said first direction, said drive pawl engaging said first ratchet ring in the arc length corresponding to said toothless region only when said drive pawl engages said notch of said second ratchet ring.

4,536,628
PUSHBUTTON SWITCH ASSEMBLY WITH INTEGRATED LOCK-DOWN SWITCH

Werner Willhaus, Stuttgart, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 11, 1984, Ser. No. 598,947
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314772
Int. Cl.³ H01H 9/28
U.S. Cl. 200—43.08 4 Claims

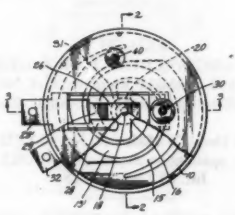


1. A pushbutton switch assembly, comprising a printed circuit provided with contacts and conductors and a switching mat of elastic material placed thereover, which comprises domes associated with pushbutton keys, and in the cavities of which the moving contacts are accommodated, wherein a lock-down switch, whose lock cylinder comprises a rotatable trip cam, is integrated into said pushbutton switch assembly and is disposed in such a way above the switching mat that a dome becomes operable upon rotation of the trip cam.

4,536,629
GAS DAMPED ACCELERATION SWITCH

Robert W. Diller, Pasadena, Calif., assignor to Technar, Incorporated, Arcadia, Calif.

Filed Nov. 3, 1983, Ser. No. 548,337
Int. Cl.³ H01H 35/14
U.S. Cl. 200—61.45 R 14 Claims

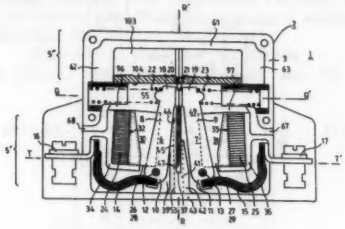


1. An acceleration sensing apparatus comprising: a base, a movable mass, means supporting the mass from the base for movement along an axis, a force generating means urging the mass in one direction along said axis, damping means controlling movement of the mass against the urging of the force generating means, the damping means including a first member secured to the base and a second member secured to the mass, the two members having broad mating surfaces which are normally held in contact by the force generating means, the mating surfaces being moved apart by movement of the mass relative to the base along said axis, the second member comprising a thin plate having an outer periphery out of contact with any surrounding structure, one side of the plate forming said mating surface with the first member, the plate being moved by the mass free of any restraining forces other than viscous damping of any surrounding air.

4,536,630
LIMITING SWITCH

Elie Belbel, Epinay; Christian Blanchard, Nanterre; Louis Fechant, Le Vesinet; André Haury, Le Raincy, and Michel Lauraire, Courbevoie, all of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Feb. 3, 1984, Ser. No. 576,847
Claims priority, application France, Feb. 4, 1983, 83 01750
Int. Cl.³ H01H 33/06
U.S. Cl. 200—151 10 Claims



1. In a current limiting switch comprising, in a case: at least one mobile lever subject to the action of a resilient member which applies one against the other separable contact pieces directly placed at the respective ends of the lever arm carrying the mobile contact and a contact support roughly parallel to said arm; a thin electrically insulating screen which is placed between the lever arm and the support so that its edge is inserted between the contact pieces, while maintaining the insulation between the lever and the support, when these latter move away from each other following short circuit currents flowing in the switch, the ends of said contact supports, where said contact pieces are located in the immediate vicinity of an insulating surface of the case, so that the path of the arc is essentially tangential with respect to the movement of the mobile contact, the movement of said edge towards and against this insulating surface causing first of all shearing of the arc and then establishing complete and sealed electric insulation between two opposite chambers which the screen separates within the internal volume of the case.

4,536,631
INDUCTION HEATING COOKING APPARATUS

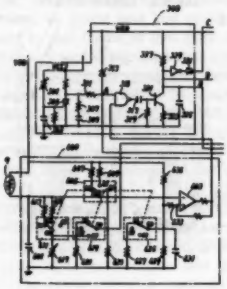
Yoshihisa Tazima; Masayuki Morishima, both of Kiryu; Hiroshi Okumura, and Shin-ichi Kasahara, both of Ashikaga, all of Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Division of Ser. No. 163,088, Jun. 26, 1980, Pat. No. 4,438,311. This application Nov. 3, 1983, Ser. No. 548,289
Claims priority, application Japan, Jul. 5, 1979, 54-85638; Jul. 5, 1979, 54-85639; Jul. 5, 1979, 54-85640
Int. Cl.³ H05B 6/06
U.S. Cl. 219—10.77 13 Claims

1. An induction heating cooking apparatus comprising:
low frequency voltage source power supply means for supplying a low frequency ripple voltage for electric power,
intermittent high frequency oscillating means being supplied with said electric power for causing intermittent high frequency oscillation at predetermined intervals, said high frequency oscillation being caused during an oscillation period and being stopped during a non-oscillation period,
induction heating coil means for receiving a high frequency current from said intermittent high frequency oscillating means for generating a high frequency alternating magnetic field for induction heating a load by said alternating magnetic field,
oscillation detecting means for detecting the output of said intermittent high frequency oscillating means during a period corresponding to said non-oscillation period,

oscillation stopping means responsive to said oscillation detected output from said oscillation detecting means for stopping said high frequency oscillation by said intermittent high frequency oscillating means,

said intermittent high frequency oscillating means comprises self-excited oscillating circuit means responsive to said start signal from said start signal generating means for



starting oscillation for maintaining said oscillation responsive to the oscillation output and for stopping said oscillation in the vicinity of the trailing end of said low frequency ripple voltage, and

attenuating oscillation detecting means responsive to said start signal from said start signal generating means for detecting the presence/absence of attenuating oscillation of said self-excited oscillation circuit means.

4,536,632

WIRE-CUT ELECTROEROSION METHOD AND APPARATUS UTILIZING WIRE-CLEANING MEANS

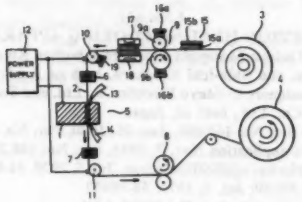
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jun. 3, 1983, Ser. No. 500,860

Claims priority, application Japan, Jun. 3, 1982, 57-95717

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **10 Claims**



1. A method of electroerosively cutting an electrically conductive workpiece by means of a traveling electrode, comprising the steps of:

(a) dispensing an unused, thin, continuous electrically conductive wire from a wire storage reel in an air space to advance the dispensed unused wire while in contact with air along a wire feed path;

(b) guiding the advancing wire by means of a pair of spaced-apart wire guide members across the workpiece to constitute said traveling electrode moving while in contact with a liquid machining medium along a single, straight-line cutting path established by said members penetrating the workpiece in a cutting zone downstream of said wire feed path, the wire electrode being taken up downstream of said cutting path for disposal;

(c) applying to said wire traveling between said guide members a sufficient tension to maintain it tensely stretched therebetween, and moving substantially in alignment with said single, straight-line cutting path and spacedly juxtaposed with the workpiece in the cutting zone;

(d) effecting a succession of erosive electrical discharges between said tensely stretched traveling electrode wire and the workpiece through the liquid machining medium while translationally displacing said straight-line cutting path in the workpiece along a programmed contouring path to electroerosively form a cut therein with a contour corresponding to said programmed path; and

(e) removing entrained air and contaminants from said thin, tensely stretched traveling electrode wire by cleaning said unused wire advancing along said wire feed path between a pair of rollers enaging opposite sides of said wire prior to its entry into said straight-line path and brushing each of said rollers continuously with respective brushes to an extent sufficient to reduce to a minimum air-bubbling from said electrode wire moving in contact with said liquid machining medium in said cutting zone and so that said cleaning occurs before said wire ever enters said zone, thereby preventing said wire from breaking in said cutting zone.

4,536,633

DIELECTRIC FLUID FOR ELECTRICAL DISCHARGE MACHINING

Masahiro Onizuka, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 233,368, Feb. 11, 1981, abandoned. This application Dec. 7, 1983, Ser. No. 558,708

Claims priority, application Japan, Feb. 18, 1980, 55-18659; Feb. 18, 1980, 55-18660; Feb. 18, 1980, 55-18661

Int. Cl.³ B23P *1/16*

U.S. Cl. 219—69 D **28 Claims**

1. A dielectric fluid comprising a non-combustible aqueous solution of an ester having a high flash point used as a dielectric fluid in electrical discharge machining, wherein said ester is selected from the group consisting of acetate ester, carbonate ester and phosphate ester of the formula $PO(OR)_3$ wherein R is an alkyl group of 1 to 8 carbon atoms or an aryl group, and wherein said dielectric fluid has a machining electrode immersed therein.

4,536,634

HOT WIRE ARC WELDING TORCH ASSEMBLY

Akiyoshi Nawa, and Yoshiaki Kato, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 453,570

Claims priority, application Japan, Jan. 8, 1982, 57-1110[U]

Int. Cl.³ B23K *9/28*

U.S. Cl. 219—74 **3 Claims**

1. A hot wire arc welding torch assembly, comprising:

(a) a non-consumable metal electrode (12),

(b) a filler metal (6) electrically connected in series with and energized by a power source (8),

(c) means (4) for heating said filler metal to feed a weld puddle (11) formed by an arc (10) between said electrode and a workpiece (7),

(d) a collet body (15) for holding said electrode,

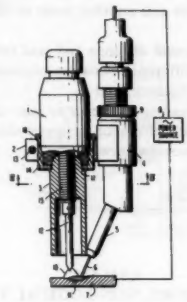
(e) a shielding gas nozzle (3) surrounding said collet body,

(f) a torch body (1) molded from a synthetic resin interiorly and centrally axially mounting said collet body and shielding gas nozzle, said torch body having an inwardly tapered outer suface at a lower end thereof,

(g) an insulating bushing (14) having heat-proof and high insulation resistance characteristics, said bushing having an inner surface complementary to and surrounding the tapered outer surface of said torch body, and

(h) a clamping holder (2) securely coupling said filler metal heating means with said torch body through said insulat-

ing bushing, wherein the outer surface of said insulating bushing engaged by said clamping holder has a straight cylindrical configuration, wherein said insulating bushing includes stop means (18) for engaging and fixing the position of said holder, and wherein said insulating bushing



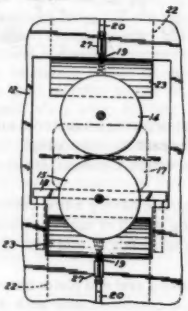
has a central lower aperture of a smaller diameter than the maximum outside diameter of said shielding gas nozzle, said central aperture being defined by an inwardly projecting flange of said bushing which engages and seats against a shoulder (17) of said nozzle.

4,536,635

METHOD AND APPARATUS FOR CLEANING WELDING ELECTRODE WHEELS WITH HIGH PRESSURE WATER

Forrest A. Shook, Fenton, Mich., assignor to NLB Corp., Wixom, Mich.

Filed Sep. 12, 1983, Ser. No. 531,053
Int. Cl.³ B23K *11/36*
U.S. Cl. 219—83 **8 Claims**



8. A method of cleaning wheel electrodes on a plurality of welding machines being connected to a tank and a pump comprising the steps of:

welding workpieces at each welding machine;

interrupting the welding step selectively and independently at each welding machine;

pumping fluid continuously at high pressure from the tank into a manifold;

spraying the fluid from the manifold through adjustably located nozzles in a controlled spray pattern upon the wheel electrodes during said welding step at each welding machine;

diverting the fluid from the wheel electrodes to a discharge means during the interrupting step independently on each welding machine, whereby the quantity of fluid delivered by the manifold remains substantially constant regardless of the operation of the welding machines; and

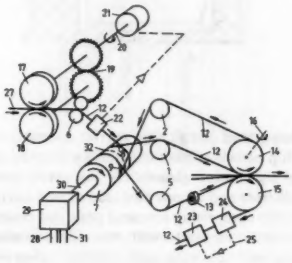
returning the fluid from the wheel electrodes and the discharge means to the tank.

4,536,636

METHOD AND MACHINE FOR ELECTRICAL RESISTANCE ROLL SEAM WELDING WITH A SINGLE ELECTRODE-WIRE

Paul Opprecht, Herrenbergstrasse 10, CH-8962 Bergdietikon, Switzerland; Wolfgang Weil, Heitersheim, Fed. Rep. of Germany, and Martin Kaul, Bellikon, Switzerland, assignors to Paul Opprecht, Bergdietikon, Switzerland

Filed Jan. 25, 1984, Ser. No. 573,666
Claims priority, application Switzerland, Jan. 27, 1983, 444/83
Int. Cl.³ B23K *11/06*
U.S. Cl. 219—83 **21 Claims**



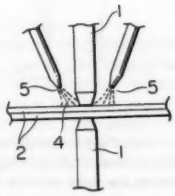
1. In a method of electrical resistance roll seam welding with a single electrode wire comprising the steps of passing said wire through a rolling out stage to roll out the same and thereby increase its strength, and passing the rolled-out electrode wire in a given path over a first and then over a second electrode carrier roll while said first and second carrier rolls are urged against one another, the improvement comprising the step of positively cooling said electrode wire in at least one of a) a stretch of said wire path between said rolling-out stage and said first carrier roll or b) a stretch of said path between the first and second carrier rolls, by passing the wire in each such stretch through a cooling station to reduce the wire temperature a sufficient amount to increase its elastic limit above its elongation point under substantially a given set of welding conditions.

4,536,637

METHOD FOR PREVENTING THE DISCOLORATION OF AREAS AROUND INDENTATION IN SPOT WELDING

Hajimu Horiuchi, and Akira Sakaguchi, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 30, 1984, Ser. No. 595,478
Claims priority, application Japan, Apr. 4, 1983, 58-59795
Int. Cl.³ B23K *11/16*
U.S. Cl. 219—117.1 **10 Claims**



1. A method for preventing the discoloration of an area

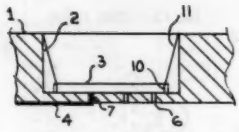
around an indentation formed in spot welding stainless steel, comprising masking a weld zone and its surrounding area from ambient atmospheric air with non-oxidizing gas, conducting spot welding in an atmoshpere of said non-oxidizing gas to thereby prevent the discoloration from occuring on the welded metal surface under the influence of heat during spot welding.

4,536,638

CHIP ASSEMBLY

Witold Krynicki, 321 W. Leroy Ave., Arcadia, Calif. 91006

Filed Sep. 30, 1982, Ser. No. 429,845
Int. Cl.³ B23K *26/00*
U.S. Cl. 219—121 LC **9 Claims**



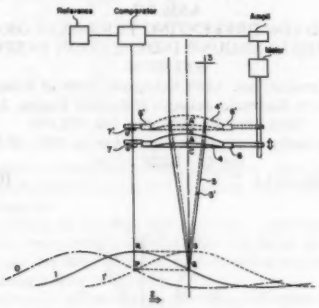
1. An integrated circuit chip carrier assembly comprising: a molded chip carrier substrate including a cavity portion molded-in chip registration elements in the cavity portion molded on said substrate and on one first side of said cavity portion; at least one chip comprising terminal pads and positioned within said registration elements with the side containing terminal pads facing said substrate; said molded substrate containing interconnecting through-holes corresponding to said terminal pads on said chip; a printed circuit on the second opposite side of said molded chip carrier substrate and printed through said through-holes and in electrical contact with said terminal pads on said chip.

4,536,639

REGULATING SURFACE TREATMENT BY LASER BEAM

Jean R. Crahay, Francorchamps, Belgium, assignor to Centre de Recherches Metallurgiques Centrum Voor, Brussels, Belgium

Filed Feb. 15, 1983, Ser. No. 466,614
Claims priority, application Belgium, Feb. 17, 1982, 892184
Int. Cl.³ B23K *26/02*
U.S. Cl. 219—121 LU **11 Claims**



1. A method for regulating the position of a focusing element with respect to the surface of the moving part to be treated by a laser beam, wherein the laser beam is focused by said focusing element as a cone having an apex to be located on the surface of said moving part, the method comprising the steps of:

initially positioning said focusing element so as to locate said apex at a first point of said surface;

choosing a point of the focusing element;

determining the distance between said first point of the surface and said point of the focusing element, said distance being taken as a reference distance;

measuring the actual distance between said point of the focusing element and another point of the surface of said moving part;

comparing said actual distance and said reference distance;

determining the difference between said actual distance and said reference distance; and

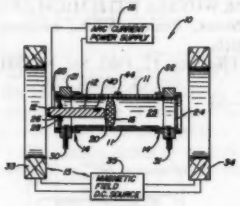
displacing said focusing elements to take up any difference between the said difference between said actual distance and said reference distance.

4,536,640

HIGH PRESSURE, NON-LOGICAL THERMAL EQUILIBRIUM ARC PLASMA GENERATING APPARATUS FOR DEPOSITION OF COATINGS UPON SUBSTRATES

Vladimir Vukanovic, Rochester, N.Y., assignor to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Jul. 14, 1981, Ser. No. 398,151
Int. Cl.³ B23K *9/00*; B05D *1/08*
U.S. Cl. 219—121 PR **11 Claims**



1. An apparatus for depositing a material on a substrate from an arc plasma, said apparatus comprising:

a chamber within which a plasma arc may be struck and maintained;

a tubular first electrode having a first central axis, opposing ends and defining a wall of said chamber;

end plates closing said ends of said first electrode to define said chamber;

a housing for mounting said end plates on said first electrode including a port in communication with the interior of said chamber for passage of a preselected gas into said chamber;

a second electrode coaxial with said first electrode, said second electrode having a tip for supporting said arc, said second electrode extending into said chamber through one of said end plates;

magnet means for establishing a magnetic field proximate said tip for inducing rotation of said plasma around said central axis of said first electrode;

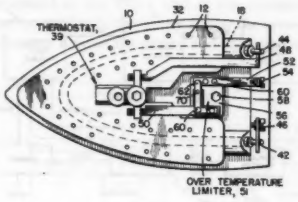
means for introducing into said plasma a material to be deposited on a substrate; and

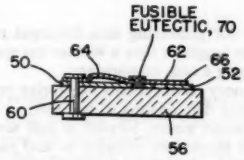
an orifice in said first electrode having a second central axis transverse to said first central axis and proximate said tip for passage out of said chamber of a tangential portion of said rotating plasma bearing said material to deposited to a substrate.

4,536,641
IRON WITH OVERTEMPERATURE PROTECTION MEANS

Ven L. Chan, Singapore, Singapore, assignor to Black & Decker, Inc., Newark, Del.

Filed Jan. 26, 1984, Ser. No. 574,295
Int. Cl.[3] D06F 75/26; H05B 1/02; H01H 37/76
U.S. Cl. 219—253 7 Claims





1. In an electric flatiron having a heater circuit of sufficient wattage to achieve abnormally high soleplate temperatures on continuous heater operation, a thermostat controlling the soleplate temperature to a normal selected operating temperature, an overtemperature protection assembly to open the heater circuit before high soleplate temperature occurs on thermostat failure, an improvement in said assembly including,

first and second circuit members in said heater circuit and electrically isolated from the soleplate and each other,

a third spring-biased circuit member bridging and contacting each of said first and second members,

a fusible joint including a slug of eutectic alloy directly bonding the third member to one of the first and second members, said alloy slug holding said third member against said bias in contact with said first and second members completing a circuit through said members, said fusible joint having a melting point above the maximum normal operating temperature of the iron, but less than the abnormally high temperature,

said joint disposed intermediate ends of the third member and out of said circuit so, on melting, the third spring-biased member is snapped out of contact to open the circuit.

4,536,642
DEVICE FOR TREATING GASES AT HIGH TEMPERATURES

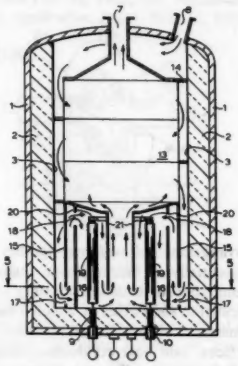
Helmüt Hamster, Burghausen, and Franz Köppl, Altötting, both of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe m.b.H., Burghausen, Fed. Rep. of Germany

Continuation of Ser. No. 268,967, Jun. 1, 1981,. This application Jul. 13, 1983, Ser. No. 513,298
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024320
Int. Cl.[3] F24H 3/00; H05B 3/02
U.S. Cl. 219—374 3 Claims

1. A device for treating silicon-containing gases at high temperatures, comprising:

a heat-insulated, generally hollow housing having a top wall, a sidewall, and a bottom plate defining a reaction chamber and gas-inlet and gas-outlet openings respectively leading into and from said housing; and

a plurality of inert resistance heaters which are heatable by the direct passage of an electric current therethrough and which are arranged in a standing, generally upright manner in said housing spaced from said top wall and bottom plate thereof such that they are arranged between said top wall and bottom plate in the general path of gases flowing

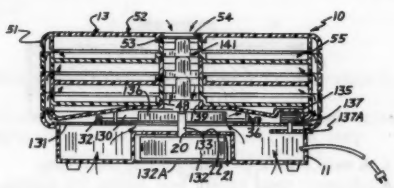


between said openings so as to have direct contact therewith said gases, said standing resistance heaters terminating at their upper ends in an electrically conductive interconnection and each having at its lower end a separate lead leaving said housing through separate insulated openings in said bottom plate and terminating outside said reaction chamber and being star-connected in a balanced multiple-phase alternating current system.

4,536,643
FOOD DEHYDRATOR

Chad S. Erickson, Maple Grove, Minn., assignor to Alternative Pioneering Systems Inc., Minneapolis, Minn.

Filed Apr. 20, 1983, Ser. No. 486,815
Int. Cl.[3] F26B 23/06
U.S. Cl. 219—400 7 Claims



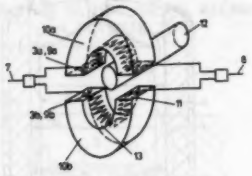
2. A dehydrator comprising:

a heat generating base unit, a plurality of trays stacked on said base unit, a convection heating unit, a forced air heating unit and a top member superimposed on said stacked trays, said base unit including a first chamber and a second chamber, said first chamber being adapted to contain said convection heating unit, said second chamber being adapted to contain said forced air heating unit, said dehydrator being convertible between a convection heating mode and a forced air heating mode by selectively mounting said convection heating unit and said forced air heating unit in their respective chamber.

4,536,644
ARRANGEMENT FOR WELDING TOGETHER THERMOPLASTIC MOLDED MEMBERS

Alfred Thalmann, Uhwiesen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Dec. 11, 1984, Ser. No. 680,389
Claims priority, application Switzerland, Dec. 19, 1983, 6737/83
Int. Cl.³ H05B 3/58
U.S. Cl. 219—535 6 Claims

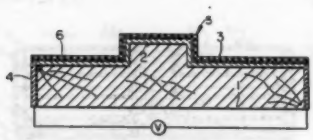


1. In an arrangement for welding together molded members consisting essentially of thermoplastic material, said molded members being shaped to define abutting surfaces extending generally parallel to each other at which a welding connection is made by means of electrical heat conductors located at said abutting surfaces, said heat conductors being adapted to be electrically activated to effect a welding operation, the improvement comprising that at least a plurality of said electrical heat conductors are connected in parallel with each other and are located between said abutting surfaces.

4,536,645
SOLID-BODY HEATING UNIT

Mitsushi Mio, Sumoto, Japan, and Hisao Negita, 11-31-202, Hikarigaoka, Hiroshima City, Hiroshima Prefecture, Japan, assignors to Awaji Sangyo Kabushiki Kaisha, Sumitomo and Hisao Negita, Hiroshima, both of, Japan

Filed Apr. 13, 1984, Ser. No. 599,829
Claims priority, application Japan, Apr. 15, 1983, 58-65217
Int. Cl.³ H05B 3/16
U.S. Cl. 219—543 2 Claims

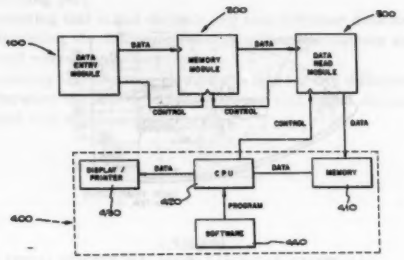


1. A mold pattern for casting metal, comprising:
a refractory mold pattern base having the pattern to be molded on the face thereof;
an electroconductive layer on said face and conforming to the shape of said pattern, said layer being 15–1000μ thick and being of an electroconductive material selected from the group consisting of Mo-Si alloy, Ti-Si alloy, Ni-Cr alloy, Fe-Cr-Al alloy, and reformed carbon, said material having a resistivity of 30–30,000 μΩcm; the layer having a larger thickness at portions at which a higher temperature is desired and having a smaller thickness at portions at which a lower temperature is desired; and
terminal means connected to said layer for passing electric current through said layer, whereby the heating temperature produced by said layer can be made different in different regions of the face of the pattern.

4,536,646
TIME ACCOUNTING SYSTEM

C. Harris Adams, Culver City, and Robert P. Farnsworth, Los Angeles, both of Calif., assignors to Celedata Corporation, Culver City, Calif.

Filed Jun. 16, 1983, Ser. No. 505,087
Int. Cl.³ G06K 7/10
U.S. Cl. 235—377 12 Claims



1. A system for generating data for input to a computer representing the length of time a worker has spent at a workstation performing a task, comprising:
portable memory circuit means for storing preselected and non-changing data relating to said task;
data entry circuit means, located at said workstation and adapted to electrically connect to said memory circuit means, for automatically and periodically writing into said memory circuit means data programmed into said entry circuit means relating to said task at said workstation; and
data reading circuit means, electrically connected to said computer and adapted to electrically connect to said memory circuit means, for transferring into said computer said data written into said memory circuit means by said entry circuit means,
whereby said memory circuit means is connected to said entry circuit means while said worker is at said workstation, said entry circuit means periodically and automatically writing said data into said memory circuit means, the number of times said data is written into said memory circuit means corresponding to the duration of time said worker has spent at said workstation, said memory circuit means thereafter being connected to said reading circuit means, whereupon all of said data in said memory circuit means is transferred into said computer system to indicate the length of time said worker has spent at said workstation.

4,536,647
POCKET BANKING TERMINAL, METHOD AND SYSTEM

Martin M. Atalla, Atherton, and Ralph R. Bestock, Los Altos, both of Calif., assignors to Atalla Corporation, San Jose, Calif.

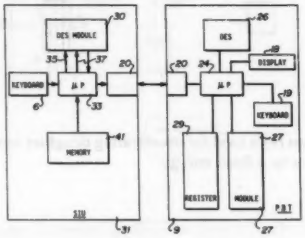
Filed Jul. 15, 1983, Ser. No. 514,011
Int. Cl.³ G06F 15/30
U.S. Cl. 235—379 15 Claims

1. The method of securing communications concerning selected data between an entity which has a master key code and a portable terminal which stores a plural number of codes that are unique to the entity and the terminal for operation by an authorized user having a Personal Identification Number, the method comprising:
encrypting in accordance with a first logical combination of the user's Personal Identification Number and the entity and terminal codes to produce a Personal Verification Number;
comparing the Personal Verification Number produced by encryption with a Personal Verification Number previ-

ously established for an authorized user and stored in the terminal to activate, upon favorable comparison thereof, the generation of random numbers at the entity and at the terminal;

transmitting the random number generated at the entity to the terminal and the random number generated at the terminal to the entity;

encrypting at the entity and at the terminal in accordance with a second logical combination the random numbers generated at the entity and at the terminal with a Key-Exchange Key at the entity and at the terminal to produce a Session Key at the entity and at the terminal;



encrypting at the terminal as a third logical combination the selected data and the Session Key to produce an encrypted message for transmission to the entity;

decrypting the encrypted message at the entity in accordance with the third logical combination to yield the selected data;

altering portions of the decrypted selected data at the entity and encrypting the same according to the third logical combination with the Session Key to produce a return encrypted message for transmission to the terminal; and

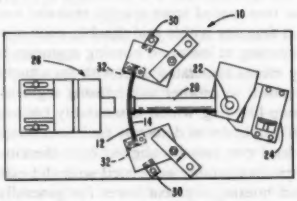
decrypting the return encrypted message at the terminal in accordance with the third logical combination to yield the altered data for operation thereon at the terminal.

4,536,648

OPTICAL CARD READ/WRITE SCANNING SYSTEM

Richard M. Kruse; David J. Moffett; Madhu C. Patel, and Ronald L. Barnes, all of Wichita, Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 30, 1984, Ser. No. 635,690
Int. Cl.³ G06K 7/10
U.S. Cl. 235—454 **10 Claims**



1. Apparatus for optically reading a document having a transversely positioned data field thereon comprising

means supporting the document in arcuate manner,

means positioned opposite the data field on the document and movable in the Y direction for reading the extent of the data field, and

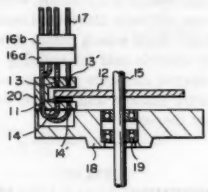
means responsive to a coil signal and operably associated with the document supporting means for swinging thereof a limited manner in the X direction.

4,536,649

PHOTOELECTRIC CONVERTER-TYPE PULSE ENCODER

Yoshinori Kozai, Hino; Yoichi Amemiya, Hachioji, and Sunao Asahara, Hino, all of Japan, assignors to Fanuc Ltd., Tokyo, Japan

PCT No. PCT/JP82/00042, § 371 Date Oct. 18, 1982, § 102(e) Date Oct. 18, 1982, PCT Pub. No. WO82/02945, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 16, 1982, Ser. No. 438,846
Claims priority, application Japan, Feb. 16, 1981, 56-20180
Int. Cl.³ G01D 5/34
U.S. Cl. 250—231 SE **2 Claims**



1. In a photoelectric converter-type pulse encoder comprising a light-entrance portion having a plurality of light emitting elements, a rotating slit plate having an encoding lattice formed thereon, a fixed slit plate having a lattice formed thereon and arranged to face said lattice of said rotating slit plate, and a light-receiving portion having a plurality of light receiving elements corresponding to said light emitting elements, the improvement comprising:

a light fixing member consisting of a unitary member positionable with respect to said slit plates and formed with two legs extending parallel to each other on opposite sides of said slit plates, said legs having a plurality of pairs of holes formed therein to provide corresponding light-entrance and light-receiving portions aligned respectively with each other so that the axes of respective holes in said light-entrance portion and light-receiving portion coincide; and

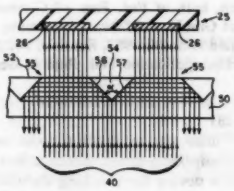
pairs of light fibers extending through said holes and fixed in said light fixing member to provide respectively light emitting elements at said light-entrance portion and light receiving elements at said light-receiving portion, said pairs of light fibers having end surfaces respectively in facing relationship whereby respective light emitting and light receiving elements are fixed permanently in alignment.

4,536,650

OPTICAL TRANSDUCER WITH A TRANSPARENT SHUTTER DISK

Ugo Carena, Ivrea, and Paolo Rivera, Strambino, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 26, 1983, Ser. No. 461,137
Int. Cl.³ G01D 5/34
U.S. Cl. 250—231 SE **6 Claims**



1. An optical transducer for detecting the position of a movable member with respect to a fixed structure comprising a

light source for generating a light beam, a photodetector for receiving said light beam, and a shutter member disposed between said light source and said photodetector, said shutter member having two faces which are parallel to each other, at least one of said two faces being provided with a plurality of light interrupting means for interrupting said light beam, separated by a plurality of light transmitting means which selectively transmit said light beam to said photodetector in response to the movement of said movable member, each one of said light transmitting means having a predetermined light transmitting area, wherein said photodetector comprises a plurality of photosensitive elements each one having a photosensitive area which is smaller than the light transmitting area of each one of said transmitting means, wherein said photosensitive elements are diffusely distributed over the region illuminated by said light beam which passes through said transmitting means, and wherein said interrupting means comprises a plurality of V-shaped elements provided on said at least one face of said shutter element and capable of totally deflecting the light incident thereon.

4,536,651

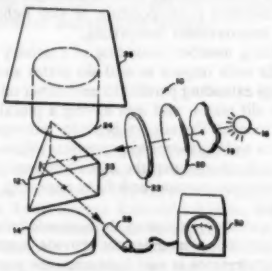
OPTICAL WEIGHING SCALE UTILIZING A PRISM

Thomas W. Bosse, New Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 14, 1983, Ser. No. 474,852

Int. Cl.³ G01L *1/24*

U.S. Cl. 250—231 R **7 Claims**



1. An optical transducer comprising:

an optical prism, means for supporting said prism, means for selectively applying a load to said prism parallel to said support means, means for directing light to said prism substantially normal to the direction said load is applied and means for determining the magnitude of said load by measuring the intensity of light internally reflected from said prism.

4,536,652

HYBRID MASS SPECTROMETER

Graham Cooks, West Lafayette, Ind.; Michael S. Story, Los Gatos, Calif.; Gerhard Jung, Delmenhorst, and Peter Dobberstein, Bremen, both of Fed. Rep. of Germany, assignors to Finnigan Mat GmbH, Fed. Rep. of Germany

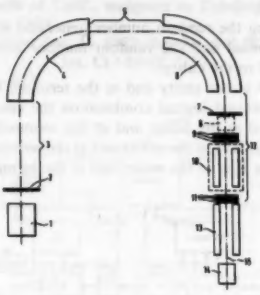
Filed Oct. 14, 1983, Ser. No. 542,117

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 3238474

Int. Cl.³ H01J *49/26*

U.S. Cl. 250—281 **11 Claims**

1. A hybrid mass spectrometer for the mass analysis of daughter ions, comprising an ion source, a first electric and/or magnetic stage, a device for breaking the ions into daughter ions, a lens arrangement and a second stage with at least one analyzer, wherein a high-energy collision chamber (**8**) is provided, the high-energy collision chamber (**8**) is located in a field-free region (**12**) which, in the direction of travel of the ions, is located after the first stage (**4**, **6**), and wherein the lens



arrangement (**9**) is used for decelerating daughter ions of different energies to a fixed energy.

4,536,653

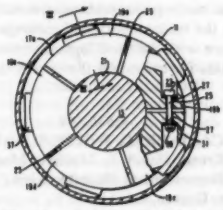
SEISMIC RESTRAINT MEANS

Norman C. Thurlow, Horseheads; Walter R. Hayter, Elmira, and Richard C. Schockner, Big Flats, all of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1983, Ser. No. 461,790

Int. Cl.³ G01T *3/00*

U.S. Cl. 250—390 **8 Claims**

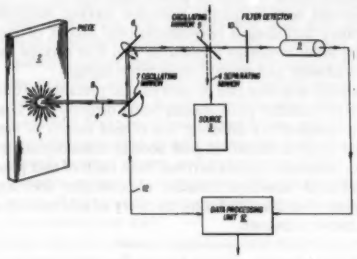


8. In combination, a generally cylindrical nuclear radiation detector, a tubular thimble on which said detector is disposed and at least two spaced apart seismic restraint means for supporting said detector within said thimble, each of said restraint means comprising at least two housing segments having interconnecting means associated therewith for attaching one said housing segment to another said housing segment in order to form a clamp-like ring which is securably connectable about the generally cylindrical detector, each said housing segment having at least one radially aligned bore therein and energy absorbing means operably associated with and extending from each of said housing segment bores for generally radial displacement relative to said detector such that the tubular thimble is contacted thereby, said energy absorbing means including a motion damping means consisting of a resilient material which is non-resonant disposed in said bore and a plunger means having an electrically non-conductive thimble contacting means secured thereon, said bore being dimensional to receive said plunger therein, in contact with said motion damping means, such that radial displacement of said plunger means is effected through the compression and expansion of said motion damping means disposed within said bore.

4,536,654
DEVICE FOR DETECTING FLAWS ON A PIECE

Jean F. Vaerman, Vert St Denis, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation, Paris, France

Filed Apr. 21, 1983, Ser. No. 487,108
Claims priority, application France, Apr. 27, 1982, 82 07202
Int. Cl.³ G01N *21/27*
U.S. Cl. 250—458.1 **7 Claims**



1. In a device for detecting flaws on a piece by the automatic reading of indications representative of the flaws to be detected which indications are given by a liquid which, under the action of a light of a first wavelength, emits a radiation of light of a second wavelength, said device being of the type having a source which emits a beam of light of the first wavelength which illuminates the piece to be studied, after said first wavelength beam is reflected by a separating mirror which separating mirror reflects said light of the first wavelength and passes said light of the second wavelength, and with a portion of the light of said second wavelength emitted by said liquid forming a beam which is parallel to and in the opposite direction from said beam of light of the first wavelength reflected by said separating mirror and with said second wavelength beam being detected by a detector, the improvement comprising:

said source emitting a focused beam; and

first and second oscillating mirrors placed between said separating mirror and said piece to simultaneously assure on the one hand the sweeping of the piece along two coordinate axes by the first wavelength beam and on the other hand the directing onto the detector of said second wavelength beam emitted by said liquid parallel to and in the opposite direction from said first wavelength beam.

4,536,655
FLUOROMETER HAVING AN IMPROVED OPTICAL SYSTEM

Clarence W. Barnes, San Francisco, Calif., assignor to Axonics, Inc., Mt. View, Calif.

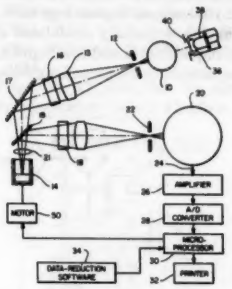
Filed Aug. 29, 1983, Ser. No. 527,366
Int. Cl.³ G01L *1/20*
U.S. Cl. 250—461.1 **17 Claims**

1. A low profile optical sensing system for an ultraviolet energized fluorescent light responsive device wherein ultraviolet light is imaged on a selected one of a plurality of samples carried in sample wells, the wells defining a sample plane, the ultraviolet light passing along a first light path, wherein fluorescent light emanating from said selected sample is detected along a second lignt path which in part is in common with said first light path, the sensing system comprising:

an ultraviolet tube located to the side of said common light path above said sample plane,

a fluorescence detector located on the same side of said light path and between the ultraviolet tube and the sample plane, and

means defining one end of said common path for passing ultraviolet rays from a source of said ultraviolet light to said sample along said common path,

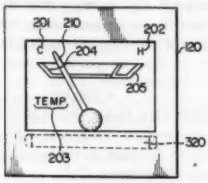


and means reflecting said fluorescent light to said fluorescence responsive device.

4,536,656
PHOSPHOR INDICATION DEVICE

Kunihiro Sowa, Okazaki, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 7, 1983, Ser. No. 472,990
Claims priority, application Japan, Apr. 2, 1982, 57-55703
Int. Cl.³ G09F *13/20*
U.S. Cl. 250—463.1 **8 Claims**



1. A phosphor indication device of a meter comprising:

an indication section formed on an indicator panel and showing a pattern and characters printed on it with a phosphor-containing paint; and

a light source for irradiating the phosphor-containing paint to excite a phosphor to emit light to thereby indicate the pattern and characters in fluorescence;

the indicator panel and light source are accommodated in a meter casing;

wherein the pattern and characters on the indicator panel are of at least one phosphor-containing paint which differs in color when it is exposed to light capable of exciting the phosphor to emit light from when it is exposed to ordinary light unable to excite the phosphor to emit light.

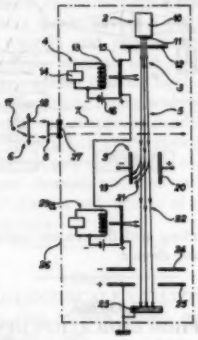
4,536,657
PROCESS AND APPARATUS FOR OBTAINING BEAMS OF PARTICLES WITH A SPATIALLY MODULATED DENSITY

Michel Bruel, Veurey-Voroize, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 7, 1983, Ser. No. 558,950
Claims priority, application France, Dec. 8, 1982, 82 20564
Int. Cl.³ H01J *37/302, 37/317, 27/24;* G21K *1/00*
U.S. Cl. 250—492.2 **17 Claims**

1. A process for obtaining beams of particles having a spatially modulated density, wherein it comprises passing the

particles of a primary beam of particles in a first high-energy state E_1, so as to form the beam of particles in said first high-energy state E_1, selectively passing the particles in the first high-energy state E_1 to a second high-energy state E_2 with the aid of a light flux having a spatially modulated intensity, directed onto the beam of particles in said first high-energy state E_1, and separating the particles in the second high-energy state E_2 from



particles in the first high-energy state E_1, so as to obtain a beam formed by particles in the first high-energy state E_1 and a beam formed from particles in the second high-energy state E_2, said beams being separate and having a spatially modulated density, wherein one of the said first and second high-energy states E_1 and E_2 is a long life high-energy state and wherein the other high-energy state is an ionized state, whose ionization state differs from that of the long life high-energy state.

4,536,658

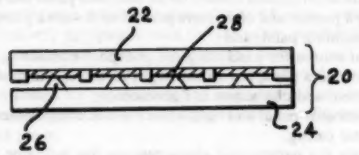
HYBRID SCHOTTKY INFRARED FOCAL PLANE ARRAY

Charlotte E. Ludington, Sherborn, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 5, 1983, Ser. No. 455,715

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—578 **1 Claim**



1. A hybrid Schottky infrared internal photoemission focal plane array comprising:

a first semiconductor substrate having a first surface and an opposed second surface, said first semiconductor substrate being formed of silicon material;

a plurality of infrared sensitive metallic photodiodes arranged in a two-dimensional mosaic pattern on said first surface of said first semiconductor substrate;

each of said plurality of infrared sensitive metallic photodiodes comprising platinum silicide material formed at said first surface of said first semiconductor substrate to establish a Schottky potential barrier at the interface of said platinum silicide material and said silicon material of said first semiconductor substrate;

each of said plurality of infrared sensitive metallic photodiodes having a metallic bonding pad formed on said platinum silicide material for deriving an output signal therefrom;

each of said plurality of infrared sensitive metallic photodiodes being surrounded by a guard ring having a width of two to eight micrometers;

a channel stop having a width of one to five micrometers disposed between each said guard ring; and

a second semiconductor substrate having a first surface and an opposed second surface, said second semiconductor substrate being formed of silicon material;

said second semiconductor substrate having multiplexing circuitry including a two-dimensional matrix of metallic signal input terminals formed on said first surface thereof for receiving and multiplexing input signals;

said metallic bonding pad of each of said plurality of infrared sensitive metallic photodiodes being directly and conductively bonded to a different one of said matrix of metallic signal input terminals of said second semiconductor substrate, whereby signals derived from each of said plurality of infrared sensitive metallic photodiodes are directly coupled to said multiplexing circuitry of said second semiconductor substrate.

4,536,659

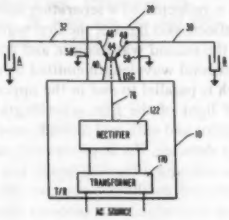
VISIBLE DISCONNECT/GROUND SWITCH

James P. Seitz, Burlington, and Michael Helmers, Hopewell, both of N.J., assignors to NWL Transformers, Bordentown, N.J.

Filed Sep. 20, 1983, Ser. No. 533,862

Int. Cl.³ H02J *3/14*; H01H *33/54*

U.S. Cl. 307—41 **12 Claims**



12. For use in a high voltage rectified power distribution system including at least two loads to be powered, conductors to carry power to the loads, a transformer for providing a source of alternating high voltage, a rectifier coupled to the transformer for rectifying the voltage, and a transformer/rectifier housing, an improved disconnect/ground switching mechanism comprising:

bushing means having a longitudinal opening therethrough, a supporting end, and a mounting end for mounting to the transformer/rectifier housing;

power conductor means disposed through said longitudinal opening in said bushing means having a first connection end and a second end for coupling to the rectifier;

switch mechanism housing means for mounting to the transformer/rectifier housing and having a first aperture for receiving said bushing means, first and second opposed side wall members, respectively having second and third apertures, flange means around at least a portion of the periphery of said second and third apertures, a supporting top member, a front wall member having a viewing aperture therethrough;

first electrical contact means supported by and physically mounted on said supporting end of said bushing means in electrical contact with said connection end of said power conductor means;

second and third electrical contact means mounted in said switch mechanism housing means, each for providing a source of ground potential;

roller means rotatably mounted on each of said first, second, and third electrical contact means;

first and second switch contact means, each having an electrically conductive elongated body having a mounting end and an oppositely disposed contact portion, where said contact portion includes a curved surface for engaging the associated ones of said first, second, and third electrical contact means and said roller means supported thereon;

electrically insulating stand-off means mounted intermediate said supporting top member and said first and second switch contact means for providing rotatable support of said first and second switch contact means and for insulating said first and second switch contact means from said switch mechanism housing means, said stand-off means including first electrically conductive support means for rotatably coupling to said mounting end of each of said switch contact means, and second electrically conductive support means for supporting and electrically coupling each of said switch contact means to an associated one of the conductors; and

switch actuator means coupled to said mounting end of each of said first and second switch contact means for selectively actuating said first and second switch contact means to make electrical contact with the selected ones of said first, second, and third electrical contact means.

4,536,660

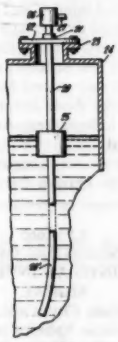
FLEXIBLE MEANS FOR MEASURING LIQUID LEVEL

Roland G. Tetro, Bristol, Conn., assignor to Delaval Turbine Inc., Princeton, N.J.

Continuation of Ser. No. 417,455, Sep. 13, 1982, abandoned, which is a continuation of Ser. No. 93,181, Nov. 13, 1979, , which is a division of Ser. No. 912,218, Jun. 5, 1978,. This application Aug. 15, 1983, Ser. No. 523,031

Int. Cl.³ H01H *35/18*

U.S. Cl. 307—118 **10 Claims**



1. A tank-level measuring system, comprising an assembly of an elongate flexibly bendable tubular housing closed at its lower end, a magnet carrying float element encircling and guided by said housing for travel therealong as a function of the level of the fluid being measured, a flexibly bendable interconnected array of a plurality of magnetically-sensitive electrical switch units in uniformly spaced and electrically interconnected successive longitudinal array within and along the length of said tubular housing, said array being free for withdrawal lengthwise from said housing and reinsertable at will, and electrical-connection means connected to the upperunit end of said array; said assembly of housing and interconnected array being non-destructively bendable by virtue of its mechanical flexibility without interfering with movement of said float.

4,536,661

POSITION-SENSING APPARATUS

David R. McMurtry, Wotton-Under-Edge, England, assignor to Renishaw plc, Wotton-Under-Edge, England

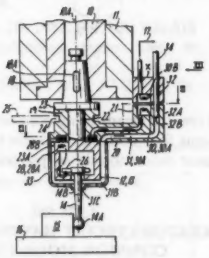
PCT No. PCT/GB83/00263, § 371 Date Jun. 8, 1984, § 102(e) Date Jun. 8, 1984, PCT Pub. No. WO84/01621, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 17, 1983, Ser. No. 619,157

Claims priority, application United Kingdom, Oct. 15, 1982, 8229594

Int. Cl.³ G01B *7/02, 7/12*

U.S. Cl. 307—119 **7 Claims**



1. Position-sensing apparatus comprising a spindle (10) having an axis of rotation (10A), a support structure (11) supporting the spindle (10) for rotation, a probe (12) having a body (13) releasably secured to the spindle (10) for rotation therewith, the probe (12) further having means (14) for sensing an object (15), means (26) for generating a signal (17) responsive to such sensing, and external transmission means (30) for transmitting the signal (17) from said body (13) to a locaton (X) provided on said support structure (11) at a given angular position about said axis (10A), characterised by a sleeve (19) supported on said body (13) for relative rotation therebetween about said axis but against relative axial movement, connector means (21) connecting said sleeve (19) to said support structure (11) against rotation relative thereto but allowing axial release therefrom together with release of said body (13) from said spindle (10), internal transmission means (28) for transmission of said signal (17) between said body (13) and said sleeve (19) while accommodating relative rotation therebetween, and wherein said external transmission means (30) is arranged for transmission of said signal (17) between said sleeve (19) and said location (X).

4,536,662

BIDIRECTIONAL CONSTANT CURRENT DRIVING CIRCUIT

Akira Fujii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,477

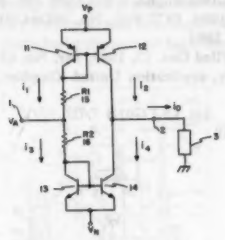
Claims priority, application Japan, Nov. 15, 1982, 57-200115

Int. Cl.³ H03K *3/26*

U.S. Cl. 307—270 **6 Claims**

1. A bidirectional constant current driving circuit having an input terminal, an output terminal and first and second power supply terminals, for driving a load coupled to said output terminal in response to an input signal applied to said input terminal, said driving circuit comprising: first transistor means having a first electrode connected to said first power supply terminal; second transistor means having a first electrode connected to said first power supply terminal, and second and third electrodes connected to a second electrode of said first transistor means; third transistor means having a first electrode connected to said second power supply terminal; fourth transistor means having a first electrode connected to said second power supply terminal, and second and third electrodes connected to a second electrode of said third transistor means; first

and second resistor means serially connected between the third electrode of said second transistor means and the third electrode of said fourth transistor means, the junction of said first and second resistor means being connected to said input terminal; and means for coupling third electrodes of said first and third transistor means to said output terminal.



4,536,663

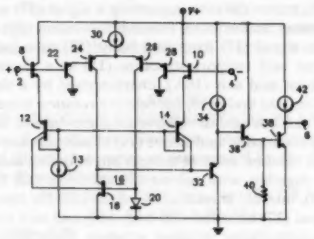
COMPARATOR CIRCUIT HAVING FULL SUPPLY COMMON MODE INPUT

Ira Miller, Tempe; Robert C. Rumbaugh, Phoenix, and John J. Price, Jr., Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1983, Ser. No. 510,006

Int. Cl.³ H03K *3/02*

U.S. Cl. 307—355 **8 Claims**



1. A circuit for comparing first and second input voltages which may vary between a first supply voltage and a second lower supply voltage, said circuit characterized by being powered by said first and second supply voltages and comprising:

current mirror means coupled to an output of said circuit;

first transistor means coupled to said current mirror means and to said output for supplying a mirrorable current to said current mirror means to reduce the voltage at said output when said first input voltage is slightly less than said second input voltage, and said second input voltage is slightly less than or substantially equal to said first supply voltage, and for supplying current to said output to increase the voltage at said output when said second input voltage is slightly less than said first input voltage, and said first input voltage is slightly less than or substantially equal to said first supply voltage; and

second transistor means coupled to said current mirror means and to said output for supplying a mirrorable current to said current mirror means to reduce the voltage at said output when said first input voltage is slightly less than said second input voltage, and said first input voltage is slightly greater than or substantially equal to said second supply voltage, and for supplying current to said output to increase the voltage at said output when said second input voltage is slightly less than said first input voltage and said second input voltage is slightly greater than or substantially equal to said second supply voltage.

4,536,664

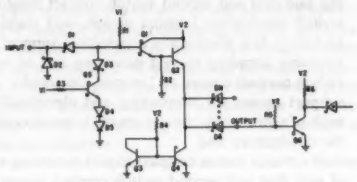
A HIGH SPEED, NON-INVERTING CIRCUIT FOR PROVIDING AN INTERFACE BETWEEN TTL LOGIC GATES AND SCHOTTKY TRANSISTOR LOGIC GATES

Robert C. Martin, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 16, 1983, Ser. No. 467,105

Int. Cl.³ H03K *19/092, 19/084, 19/013*

U.S. Cl. 307—475 **7 Claims**



1. A circuit for translating a first logic voltage to a second logic voltage for operative connection to a source of potential, comprising:

a first high barrier Schottky diode having a cathode to serve as the circuit input,

an emitter-follower transistor circuit having an input coupled to the anode of said input Schottky diode,

a second high barrier Schottky diode having an anode coupled to the input of said emitter-follower transistor circuit, and

a plurality of series-connected diodes, the first of said series-connected diodes having an anode coupled to the cathode of said high barrier Schottky diode and the last of said series-connected diodes having a cathode coupled to ground wherein said input of said emitter-follower transistor circuit is clamped to a voltage level substantially equal to the difference between said first logic voltage and the voltage across said first Schottky diode by said series-connected diodes and said second Schottky diode;

a low barrier Schottky diode coupled to receive an output from said emitter follower transistor to serve as an output for the circuit; and

a constant current source coupled to said low barrier Schottky to sink the current therethrough.

4,536,665

CIRCUIT FOR CONVERTING TWO BALANCED ECL LEVEL SIGNALS INTO AN INVERTED TTL LEVEL SIGNAL

Birney D. Dayton, Nevada City, Calif., assignor to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Dec. 27, 1982, Ser. No. 453,032

Int. Cl.³ H03K *19/092, 19/086, 19/003, 3/33*

U.S. Cl. 307—475 **12 Claims**

1. A circuit for receiving, at first and second input terminals respectively, a first input logical signal having one of two possible negative potential levels, relative to a ground reference potential level, and a second input logical signal having the other of the two possible negative potential levels, and converting said input logical signals into a logical output signal, having one of two possible positive potential levels, at an output terminal, said circuit comprising:

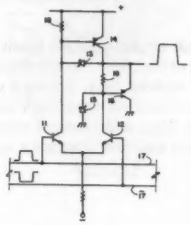
a switch device defining two current paths which are connectable to a reference potential level that is more negative than either of said two possible negative potential levels, said switch device having a first condition, in which one current path is open and the other is closed, and a second condition, in which said one current path is

closed and said other path is open, and being in said first condition when the first input terminal is at the more negative of said two possible negative potential levels and in said second condition when the second input terminal is at the more negative of said two possible negative potential levels;

a first transistor having its base connected to said one current path, the emitter of said first transistor being connectable to a reference potential level that is more positive than either of said two possible positive potential levels;

a first resistor connected between the base and the emitter of said first transistor;

a first diode connected between the base and the collector of said first transistor;



a second transistor having its base connected to said other current path and its emitter connected to said output terminal and to the collector of said first transistor, the collector of said second transistor being connectable to a reference potential level intermediate the less negative of the two possible negative potential levels and the less positive of the two possible positive potential levels;

a second resistor connected between the base of said second transistor and the collector of said first transistor; and

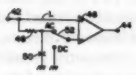
a second diode having one terminal connected to the base of said second transistor and having its other terminal connectable to a reference potential level intermediate the less negative of the two possible negative potentials levels and the less positive of the two possible positive potential levels.

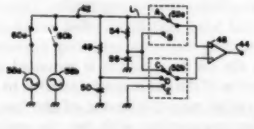
4,536,666

TRIGGER COUPLING CIRCUIT FOR PROVIDING A PLURALITY OF COUPLING MODES

Arthur J. Metz, Gervais, and Kenneth G. Schlotzhauer, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 26, 1982, Ser. No. 444,765
Int. Cl.³ H03K *17/04, 5/07, 3/023*
U.S. Cl. 307—494 **15 Claims**





1. A trigger coupling circuit for providing a plurality of coupling modes, comprising:

an input terminal for receiving a wideband electrical signal;

a high-frequency signal path coupled to said input terminal;

a low-pass filter coupled to said input terminal;

a subtraction circuit having a first and a second input, said first input coupled to said high-frequency signal path; and

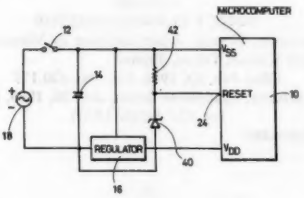
switch means coupled to said second input of said subtraction circuit, said switch means for selectively connecting one of an output from said low pass filter and a reference potential to said second input.

4,536,667

RESET PULSE GENERATOR

Sinichi Masuda, Yao, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 25, 1982, Ser. No. 436,518
Claims priority, application Japan, Oct. 30, 1981, 56-162881[U]
Int. Cl.³ H03K *17/22, 17/20, 17/06*
U.S. Cl. 307—592 **3 Claims**



1. In a reset pulse generator circuit in a power supply circuit for developing an initial reset pulse to be applied to the reset terminal of a logic circuit, said power supply including a source of electrical power, a regulator circuit having an input side connected to said source of electrical power and an output side for supplying a regulated voltage to said logic circuit, the improvement comprising:

a series circuit including a Zener diode and a resistor joined by a common node; said node being directly connected to the reset terminal of said logic circuit, one end of said resistor and one terminal of said Zener diode; the other end of said resistor being connected to one side of said source of electrical power; and the other terminal of said Zener diode being connected to the input side of said voltage regulator and the opposite side of said source of electrical power, said Zener diode being reverse biased to preclude the conduction thereof during steady state operation of said power supply circuit; and trigger means for forward biasing said Zener diode to generate said initial reset pulse at said node when said power supply suddenly goes fron an OFF to an ON state.

4,536,668

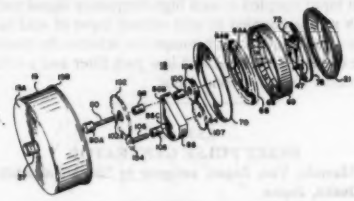
VEHICLE MOUNTABLE ELECTRICAL GENERATING SYSTEM

Robert E. Boyer, 2650 Davisson St., River Grove, Ill. 60171

Filed Sep. 13, 1982, Ser. No. 417,473
Int. Cl.³ H02K *7/10*
U.S. Cl. 310—75 R **17 Claims**

1. A vehicle-mountable electrical power generating system for a wheeled vehicle, comprising, in combination, a housing, first mounting means for mounting said housing along the axis of rotation of a wheel for rotation with said wheel, second mounting means in said housing extending along the axis of rotation of said wheel, pendulum means suspended from said second mounting means, a rotatable electrical potential generating means including a generator shaft means, said generating means mounted with said pendulum means in para-axial relation to the axis of rotation of said wheel, drive means mounted for rotation with said housing and connected to rotate said generator shaft means of said generating means, said drive

means having a substantially different diameter than said generator shaft means whereby rotation of said wheel causes said



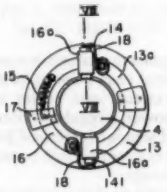
drive means to rotate said generator shaft means of said generating means at a selected rate higher than the rate of rotation of said wheel thereby generate electrical power.

4,536,669

DIRECT CURRENT MOTOR

Akira Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,175
Claims priority, application Japan, Jul. 20, 1983, 58-133917
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—241 **5 Claims**



1. A d.c. motor which comprises:
a cylindrical yoke;
at least one set of field magnets consisting of permanent magnets fixed to the inner peripheral surface of said yoke, said permanent magnets having a magnetic flux which varies with temperature, the magnetic neutral point of said field magnets being deflected when said magnetic flux varies;
an armature wound with armature windings so as to be surrounded by said field magnets;
a commutator firmly mounted on a rotary shaft of said armature;
a set of brushes being in slide-contact with said commutator;
said brushes being mounted on a brush holder which is in sliding relation with said yoke; and
a displacing means for shifting the position at which said brushes are made in slide-contact with said commutator by slidingly rotating said brush holder in the counter direction of the rotation of said armature so as to compensate for said deflection of said magnetic neutral point;
said displacing means being actuated by a rise in temperature of said d.c. motor.

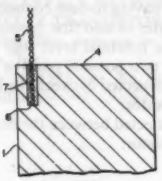
4,536,670

ELECTRICAL BRUSHES WITH WEAR SENSORS

Leonard C. Mayer, Dunn, N.C., assignor to Morganite Incorporated, Dunn, N.C.

Filed Dec. 14, 1981, Ser. No. 330,723
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—249 **7 Claims**

1. An electrical brush comprising a brush wear sensor, including a brush body having a wear surface, a passageway in said brush body extending from a surface remote from said wear surface at least to the point at which brush wear is to be sensed, a length of insulated electrical conductor doubled back onto itself intermediate its ends to form a looped portion and located in said passageway such that the doubled back looped portion extends to said point at which brush wear is to be



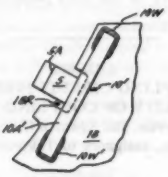
sensed and said ends extend from the brush body for connection of at least one of the ends to an electrical sensor means, at least part of said doubled back insulated conductor in said passageway being twisted such that each insulated conductor is twisted about the other, and a cement retaining said doubled and twisted insulated electrical conductor in said passageway.

4,536,671

DYNAMOELECTRIC MACHINE STATOR MOUNTING MEANS AND METHOD OF MAKING SAME

William H. Miller, Albany, N.Y., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 25, 1983, Ser. No. 487,964
Int. Cl.³ H02K *1/12*
U.S. Cl. 310—258 **17 Claims**



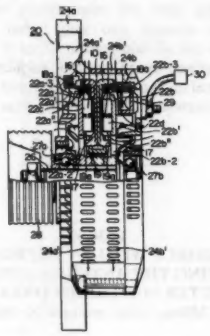
1. A stator support structure comprising: a housing having a plurality of axially spaced ribs defining a bore for receiving a stator therein, each of at least two of said ribs having areas of high radial rigidity in an outward direction and separate areas of lower radial rigidity in an outward direction, the areas of lower rigidity being spaced a substantial arcuate distance from the areas of high rigidity; and a plurality of stress relief means mounted respectively at predetermined spaced points on said two of said ribs adjacent their areas of high radial rigidity for applying predetermined compressive forces to a stator received in said bore, said stress relief means each comprising a bar and mounting means for mounting opposite end portions of the bar to the rib to which it is mounted and positioning a central portion of the bar in spatial relation to the respective rib to permit radial outward flexing of the bar without moving into abutting engagement with the rib, said mounting means comprising a pivot means at each end portion of said bar for pivotably connecting the end portions of the bar to the rib to which it is mounted enabling substantial unopposed pivoting of the end portions of the bar relative to the respective rib.

4,536,672

FLAT TYPE ROTARY ELECTRIC MACHINE

Kenji Kanayama, Kariya, and Shuzo Kinkori, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 6, 1984, Ser. No. 637,881
Claims priority, application Japan, Aug. 12, 1983, 58-159940; Aug. 31, 1983, 58-159940
Int. Cl.³ H02K 1/22
U.S. Cl. 310—268 4 Claims



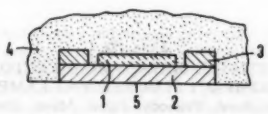
1. A flat type rotary electric machine including:
a generally annular and flat stator armature coil defining therein a central opening;
a shaft rotatably extending through said central opening; and
a pair of rotors mounted on said shaft for rotation therewith and disposed on the opposite sides of said armature coil;
said rotors having permanent magnet means disposed in opposite relationship to the annular faces of said armature coil;
said armature coil comprising:
an annular carrier member of an electrically insulating material and windings carried by said carrier member;
said windings being formed by a plurality of layers of annular rows of generally radially extending and axially thin conductors each having radially inner and outer end sections and an intermediate effective section;
the axial thickness of at least the effective section of each of the conductors of the outermost layers being smaller than the axial thickness of the effective section of each of the conductors of inner layers.

4,536,673

PIEZOELECTRIC ULTRASONIC CONVERTER WITH POLYURETHANE FOAM DAMPER

Alfred Forster, Schwandorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,132
Int. Cl.³ H01L 41/08
U.S. Cl. 310—327 3 Claims



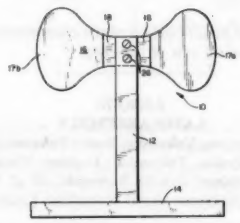
1. In an ultrasonic converter with a disk-shaped ceramic oscillator, to which metal electrodes are fastened, having one face of said disk-shaped ceramic oscillator provided with a plastic adaption layer which is one quarter wavelength, λ/4, thick relative to the converter frequency and the characteristic sound propagation velocity of the adaption layer plastic material, and said disk-shaped ceramic oscillator being surrounded by a weight ring, the improvement comprising, providing the entire ultrasonic converter, except for said adaption layer facing the medium to be insonated, with a foam covering of polyurethane foam.

4,536,674

PIEZOELECTRIC WIND GENERATOR

V. Hugo Schmidt, 1221 S. Cedarview Dr., Bozeman, Mont. 59715

Filed Jun. 22, 1984, Ser. No. 623,104
Int. Cl.³ H01L 41/08
U.S. Cl. 310—330 5 Claims



1. An improved electrical power generating apparatus utilizing a piezoelectric material for converting mechanical energy of fluid flow to electrical energy comprising:
an elongate resilient support member;
the support member being mounted to a base;
a resilient blade member having a surface of maximum extent positioned generally facing the direction of fluid flow and mounted to the support member in spaced apart relation from the base;
the blade member and support member being adapted to flex independently when the blade member is subjected to force of the fluid flow; and
a piezoelectric element being mounted to the blade member which element flexes when the blade flexes.

4,536,675

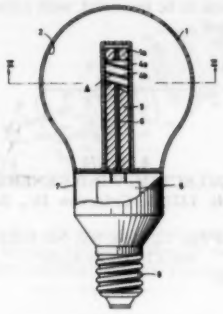
ELECTRODELESS GAS DISCHARGE LAMP HAVING HEAT CONDUCTOR DISPOSED WITHIN MAGNETIC CORE

Pieter Postma, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1982, Ser. No. 409,205
Claims priority, application Netherlands, Sep. 14, 1981, 8104223
Int. Cl.³ H01J 1/50, 7/24, 61/52
U.S. Cl. 313—46 6 Claims

1. An electrodeless gas discharge lamp having a lamp vessel which is closed in a vacuum-tight manner and is filled with a metal vapor and a rare gas, the lamp comprising a core of a magnetic material in which a radio frequency magnetic field is induceable by means of an electric power supply unit, an electric field being generated in the lamp vessel, the magnetic material core incorporating a member which is disposed within and is in contact with the core and consists of a heat-conducting material for discharging the heat generated during opera-

tion of the lamp to the environment of the lamp, characterized in that the core is in the form of a rod, the member extending



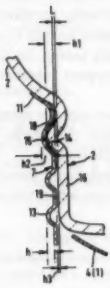
along at least the major portion of the core length at least at or near the longitudinal axis of the core.

4,536,676

LAMP ASSEMBLY

Jisaburou Maruyama, Yokosuka; Sumio Fukayama, Yokohama; Masanobu Miyake, Yokosuka; Yoshimi Watanabe, Yokohama, and Yoshinori Eguchi, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 28, 1983, Ser. No. 536,732
Claims priority, application Japan, Sep. 30, 1982, 57-171812
Int. Cl.³ A47B *88/00*
U.S. Cl. 313—318 **6 Claims**



1. A lamp assembly including a light generating source to be connected directly to a power outlet, said lamp assembly comprising:

(a) a vitreous envelope including a generallly cylindrical neck at one end thereof, said generally cylindrical neck having,

a circular outwardly protruded ring extending about the entire periphery of said neck, and an outwardly expanding circumferential skirt which adjoins said circular protruded ring;

(b) a stem mount integrally connected with said envelope and provided inside thereof with a pair of lead-in wires for supporting said light generating source and for supplying electric power thereto, said wires extending across and outwardly from said stem mount;

(c) a screw-in base adapted to be assembled to said vitreous envelope for connection to an external lighting fixture for electric power supply, said stem including

a generally cylindrical shaped screwshell provided with a concave annular channel formed inside said screwshell and extending along the entire internal surface thereof, and

a flared rim disposed next to said concave channel and expanding outwardly in the direction of said envelope, said rim defining an edge of said screwshell; and

(d) adhesive filling means provided in a space defined by said generally cylindrical neck and said screwshell for fixedly combining said two elements,

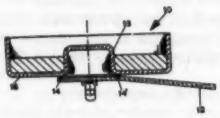
whereby said circular protruded ring and said outwardly expanding skirt are respectively engaged with said concave channel and said flared rim, and further wherein one of said lead-in wires is securely held in a space defined by an external surface of said generally cylindrical neck of said envelope and an internal surface of said screwshell for providing firm electrical contact.

4,536,677

GETTER ASSEMBLY WITH AN IMPROVED MEANS OF CONNECTING THE ANTENNA MOUNT TO THE GETTER MATERIAL CONTAINER

Franco Pirota, Milan, Italy, assignor to Saes Getters S.p.A., Milan, Italy

Filed Nov. 7, 1983, Ser. No. 549,407
Claims priority, application Italy, Nov. 11, 1982, 24194 A/82
Int. Cl.³ H01J *29/94*
U.S. Cl. 313—481 **5 Claims**



1. A getter assembly for a cathode ray tube comprising a getter material container having an external sidewall, an internal sidewall and a bottom wall connecting said external sidewall to said internal sidewall, so as to define an annular channel containing powdered getter material, the upper edge of said internal sidewall being integrally formed round a substantially disc-shaped element so as to define an upraised bottom portion as well as an antenna mount in the form of a small bar coincident with a diameter of said container and having a support means lying in a plane perpendicular to said antenna mount, the antenna mount touching said bottom wall and welded thereto only in zones very close to said internal sidewall.

4,536,678

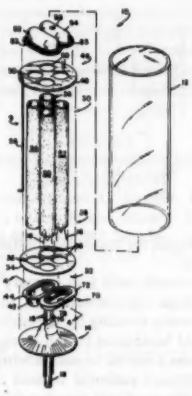
GLASS COATED METAL ARC DIRECTOR FOR COMPACT FLUORESCENT LAMP

Andre C. Bouchard, Peabody; Jakob Maya, Brookline, and Thomas Sentementes, Wakefield, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 1, 1983, Ser. No. 481,203
Int. Cl.³ H01J *5/12, 61/30*
U.S. Cl. 313—493 **4 Claims**

1. In a fluorescent lamp having an hermetically sealed outer envelope containing an arc generating and sustaining medium; an assembly positioned within said envelope, said assembly

comprising a plurality of elongated glass tubes each having first and second ends, said tubes being coated on their interior surface with a phosphor, all of said interior surfaces being open to said medium; at least one arc directing means operatively associated with said first ends of said tubes, said arc directing means forming a part of the arc path through said tubes; an electrode at either end of said arc path; and means for making electrical connection to said electrodes, the improvement



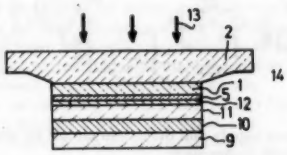
wherein: said arc directing means comprises a relatively thick, rigid, electrically conductive base member having a plurality of apertures therein, some of the apertures including means formed to receive said electrodes and other of said apertures including means formed to receive the first ends of tubes that do not contain electrodes; and an arc director associated with said other apertures, said arc director having an inside surface in communication with the arc when said lamp is operating, said inside surface having a layer of glass fused thereto.

4,536,679

PHOTOCATHODE

Pierre Guittard, Montlhery Longpont; Bernard Guillemet, Vitry-sur-Seine, and Claude Piaget, Montgeron, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,145
Claims priority, application France, Nov. 4, 1981, 81 20675
Int. Cl.³ H01J *40/16, 40/06*
U.S. Cl. 313—541 **2 Claims**



1. A photocathode comprising a transparent support bonded by a glass bonding layer to a semiconductor structure comprising a chemical passivating layer on an optical adaptation layer on an electrical passivating layer on a photoemissive layer, the transparent support acting as the window of a tube envelope, wherein the improvement comprises the support being in two parts bonded together as follows:

a first part connected to the glass bonding layer and thereby to the chemical passivating layer of the semiconductor structure, this first part comprising a glass having softening and transition temperatures which are higher than those of the glass bonding layer, and

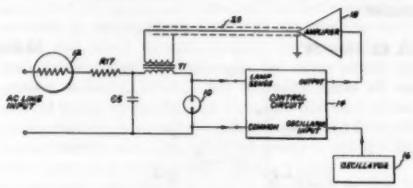
a second part for connection to the tube envelope, said second part comprising a glass having softening and transition temperatures and properties of thermal expansion substantially equal to those of the glass bonding layer.

4,536,680

RESISTIVE LAMP BALLAST WITH RE-IGNITION CIRCUIT

Victor D. Roberts, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 401,506, Jul. 26, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 652,249
Int. Cl.³ H01J *7/44;* **H05B** *37/02*
U.S. Cl. 315—49 **2 Claims**



1. A re-ignition circuit adapted to be connected to a discharge lamp, said discharge lamp being connected in series with a resistive element and being adapted to be coupled to an AC source, said re-ignition circuit comprising:

sensing means for sensing voltage across said lamp;

an oscillator coupled to said sensing means for supplying re-ignition energy across the electrodes of said lamp upon the condition during any half cycle of said AC source that said sensing means indicates that lamp voltage exceeds a predetermined value;

a transformer having one winding connected between said resistive element and said lamp and having its other winding connected to the output of said oscillator; and

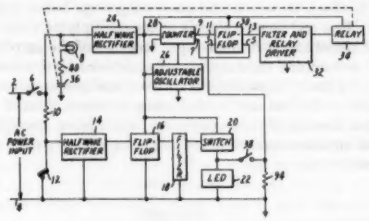
a high frequency bypass capacitor connected across the series combination of said one winding and said lamp.

4,536,681

TEMPERATURE COMPENSATED TIME EXPOSURE CONTROL CIRCUIT

Farrel M. Maki, Fridley, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 19, 1983, Ser. No. 515,297
Int. Cl.³ H05B *39/04*
U.S. Cl. 315—309 **6 Claims**



1. Control circuitry usable with a machine "ready" circuit portion for controlling the output of a light source including:

a time adjustable control circuit portion operatively connected to the machine "ready" circuit portion and to the light source, said time control circuit portion operable after the machine "ready" circuit portion presents a machine "ready" condition for providing a timed period during which the light source is energized, said time ad-

justable control circuit portion including a temperature sensitive element for shortening said timed period as the temperature sensed by said temperature sensitive element increases and lengthening said timed period as the temperature sensed decreases.

4,536,682

CIRCUIT FOR GENERATING A DEFLECTION CURRENT THROUGH THE FIELD DEFLECTION COIL OF A PICTURE DISPLAY DEVICE

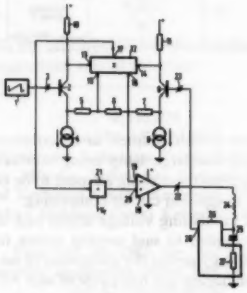
Hendrik ten Pierick, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1984, Ser. No. 575,427

Claims priority, application Netherlands, Feb. 2, 1983, 8300384

Int. Cl.³ H01J *29/70, 29/72*

U.S. Cl. 315—387 **10 Claims**



1. In a circuit for generating a deflection current through the field deflection coil of a picture display device, comprising an amplifier and a sawtooth generator for supplying a sawtooth-shaped signal to the amplifier, said amplifier having an output terminal to which a series arrangement of the deflection coil and a separating capacitor is coupled, and further comprising a feedback network included in a feedback path arranged between the said series arrangement and a feedback input terminal of the amplifier, and also means for deriving from the sawtooth-shaped signal a parabolic signal for application to a signal input terminal of the amplifier, the improvement wherein the means for generating a parabolic signal comprises a multiplying circuit and the feedback path also comprises a combining stage having a first input terminal connected to the sawtooth generator and a second input terminal connected to the feedback network, said combining stage being adapted to apply first and second signals to the multiplying circuit and a third signal to the feedbck input terminal of the amplifier; the first, second and third signals being derived by the combining stage by linear combinations of fractional proporations of the signals at the first and second input terminals thereof, and an output terminal of the multiplying circuit being coupled to the signal input terminal of the amplifier for applying the parabolic signal thereto.

4,536,683

HORIZONTAL PHASE SHIFTER

Leroy A. Sutton, Wheeling, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 23, 1983, Ser. No. 507,704

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—401 **6 Claims**

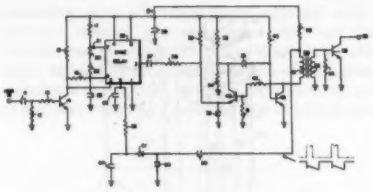
1. A horizontal deflection circuit for use with a cathode ray tube display comprising:

an output stage including a transistor having a base-emitter junction;

oscillation means including a horizontal oscillator transistor and a horizontal driver transistor;

a transformer having a primary winding coupled to said horizontal driver transistor and a secondary winding coupled to said horizontal output transistor, said transformer having a primary to secondary turns ratio greater than unity;

synchronizing means including a delay circuit generating a



synchronizing signal for controlling initiation of said horizontal oscillator;

sensing means in circuit with said primary winding for developing a voltage representative of the load reflected back to said primary winding by the emitter-base junction resistance of said horizontal output transistor; and

peak detector means coupled to said sensing means for supplying a DC control potential to said delay circuit for controlling the phase of said synchronizing signal.

4,536,684

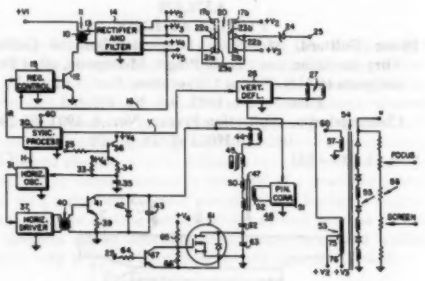
MULTIPLE SCAN RATE DEFLECTION CIRCUIT INCORPORATING SCAN COMPENSATION

William E. Babcock, Warren, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 25, 1983, Ser. No. 497,953

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—411 **3 Claims**



1. A power supply and deflection circuit for use in a video display system comprising:

means for selecting one of a plurality of horizontal deflection rates;

horizontal deflection means coupled to said selecting means for operating at said selected horizontal deflection rate, incorporating means for producing horizontal retrace pulses having amplitudes dependent upon said selected horizontal deflection rate;

a voltage source providing a plurality of predetermined different voltage levels;

means for selecting one of said voltage levels in response to said selected horizontal deflection rate;

transformer means comprising:

a transformer winding comprising a plurality of winding turns having a first terminal coupled to said means for

producing horizontal retrace pulses, and having a plurality of taps, each of said taps forming, with said first terminal, a transformer primary winding having a different number of winding turns dependent on the tap selected; and

a transformer secondary winding magnetically coupled to said primary winding for producing a secondary winding voltage in response to said retrace pulses on said primary winding; and

means for applying said selected voltage level to one of said taps in response to said selected horizontal deflection rate, said tap selected such that said secondary winding voltage remains substantially constant during retrace in response to retrace pulses of different amplitudes.

4,536,685

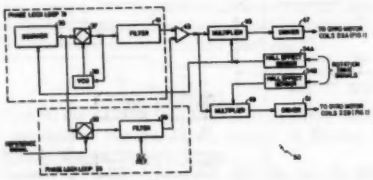
CONTROL FOR GIMBALLED MONOPULSE ANTENNA ARRANGEMENT

Jean A. Fattal, and Michael L. Roesler, both of Lexington, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Mar. 3, 1982, Ser. No. 356,699

Int. Cl.³ H02K *23/00;* **H02P** *1/18, 3/08, 5/06*

U.S. Cl. 318—254 **1 Claim**



1. In a gyroscopically stabilized arrangement wherein a rotor of an electric motor serves as a gyroscopic mass when such rotor is rotated to follow a rotating magnetic field corresponding to a similarly rotating electric field in a stator of such motor, control apparatus for determining the rotational position of such rotor, such apparatus comprising:

(a) at least one Hall effect sensor including a pair of orthogonally disposed Hall effect crystals immersed in a rotating magnetic field corresponding to the rotating electric field of the stator;

(b) first phase detector means, responsive to the output signal of the Hall effect sensor and to the output signal of a voltage-controlled oscillator, to produce a first bipolar D.C. signal representative of the difference in frequency between such output signals;

(c) second phase detector means, responsive to the output signal of the Hall effect sensor and to a reference signal having a fixed frequency, to produce a second bipolar D.C. signal representative of the difference in frequency between such output and reference signals;

(d) means for summing the first and second bipolar D.C. signals to produce a correction signal; and

(e) means, responsive to the correction signal, to change the frequency of the rotating electric field of the stator to null the correction signal, ultimately to synchronize the rotating magnetic field with the reference signal.

4,536,686

ELECTRIC MOTOR FAULT AND DYNAMIC BRAKING PROTECTION SYSTEM

Joseph J. Gartner, 335 W. Shore Dr., Wycoff, N.J. 07481

Filed Jul. 26, 1984, Ser. No. 634,561

Int. Cl.³ H02K *23/66*

U.S. Cl. 318—434 **11 Claims**

1. An electric motor fault and dynamic braking protection system for electric motor circuits having a normal operating mode in which the motor circuit input and output carry total motor current and a dynamic braking operating mode in which motors are opposed to dissipate energy comprising

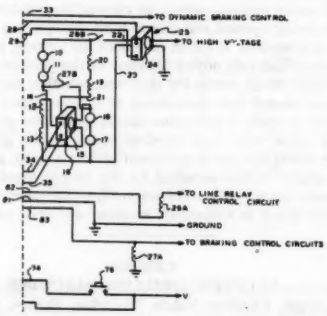
first saturable reactor means for sensing current imbalance between the motor circuit input and output in the normal mode;

second saturable reactor means for sensing current imbalance between opposing motors in the dynamic braking mode;

detector means coupled to said first and second saturable reactor means for producing fault signals when the reactor means sense a current imbalance of a predetermined magnitude in the operating modes;

bistable control means having first and second operating states selectively coupled to said detector means to receive the fault signals therefrom, said control means being operable in the first state thereof to energize the motor circuit and permit dynamic braking and operable in the second state thereof to deenergize the motor circuit and prevent dynamic braking, the operating states of said control means being shiftable from said first state to said second state in response to said fault signals and from said second state to said first state in response to either a first reset signal or a second reset signal;

first manually operable reset signal producing means for producing said first reset signal;



second manually operable reset signal producing means for producing a second reset signal;

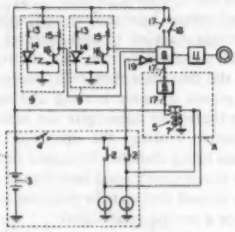
counting means having first and second operating conditions selectively coupled to said detector means and said first reset signal producing means, said counting means being operable in the first condition thereof to couple said first reset signal producing means to said control means so that said control means may be shifted from said second operating state to said first operating state in response to said first reset signal and operable in the second condition thereof to decouple said first reset signal producing means and said control means to thereby prevent shifting of said control means from said second state to said first state in response to said first reset signal, the operating conditions of said counting means being shiftable from said first condition to said second condition after receipt of a predetermined number of said fault signals and from said second operating condition to said first operating condition upon receipt of said second reset signal; and

motor circuit mode responsive switching means for selectively coupling said first and second saturable reactor means and the detector means associated therewith to said control means and counter means.

4,536,687
APPARATUS FOR CONTROLLING POWER WINDOW OF VEHICLE

Norimitsu Kurihara, Wako, and Takeshi Imai, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 564,803
Claims priority, application Japan, Dec. 23, 1982, 57-231568; Dec. 23, 1982, 57-231570; Dec. 23, 1982, 57-198923[U]
Int. Cl.³ H02H 7/08
U.S. Cl. 318—480 7 Claims

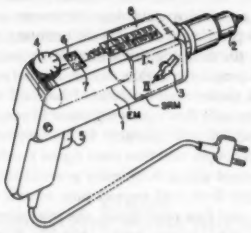


1. In a power window of a vehicle having a window motor adapted for opening and closing a window of the vehicle, said motor being connected to a power source through a main switch and a window switch for closing the window, said main switch being opened and closed with the opening and closing of an ignition switch for an engine of the vehicle, an apparatus for controlling said power window of the vehicle comprising: a window sensor means for detecting whether said window is open or closed and generating an output signal when said window is open; a detection circuit means for generating an output signal when said window sensor means generates the output signal and when said main switch is open; and an auto-close circuit means actuated by the output signal from said detection circuit means for controlling the operation of said window motor in a direction to close said open window.

4,536,688
ELECTRIC DRILLING MACHINE

Jean Roger, Conflans Sainte Honorine, France, assignor to Peugeot Outillage Electrique, Nanterre, France

Continuation of Ser. No. 426,444, Sep. 29, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 694,918
Claims priority, application France, Dec. 15, 1981, 81 23386
Int. Cl.³ G01R 31/02
U.S. Cl. 318—490 13 Claims

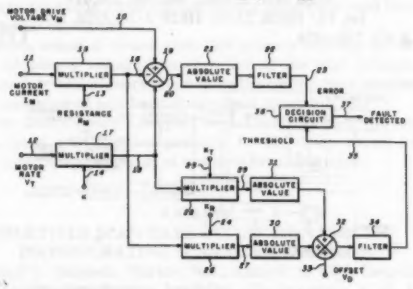


1. A machine, in particular an electric drilling machine, comprising a chuck, an electric driving motor having an output shaft, a speed reducer providing at least two mechanical ratios and coupled to the output shaft of the motor and to said chuck for driving the latter, changing means associated with the speed reducer for changing the mechanical ratio thereof, an electronic speed variator associated with the motor for varying the speed of the motor, control means operatively connected to said electronic speed variator for allowing selection of a plurality of predetermined discrete settings of said electronic speed variator, and display means connected to said changing means and said control means, said display means comprising means for displaying only those numbers corresponding to speeds within a range of discrete speed numbers, each of said discrete speed numbers being determined by a combination of particular settings of said mechanical ratio changing means and said control means, and being constant during operation of the machine.

4,536,689
SERVOMOTOR FEEDBACK FAULT DETECTOR

Dale D. Davidson, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed May 17, 1984, Ser. No. 611,305
Int. Cl.³ G05B 23/02
U.S. Cl. 318—565 9 Claims



1. A feedback fault detector for a servomotor, said motor being responsive to a drive voltage applied thereto and having an electrical resistance value associated therewith and having tachometer means coupled thereto for providing a tachometer signal proportional to the rate of rotation of said motor, comprising

first combining means responsive to said drive voltage, to the current flowing through said motor as a result of said drive voltage applied thereto and to said tachometer signal for providing a combined signal in accordance with a linear combination thereof,

second combining means responsive to said current and to said tachometer signal for providing a threshold signal in accordance with a linear combination thereof, and

decision means responsive to said combined signal and to said threshold signal for providing a fault detected signal when said combined signal exceeds said threshold signal.

4,536,690
TOOL-SUPPORTING SELF-PROPELLED ROBOT PLATFORM

Charles A. Belsterling, Norristown, and Robert K. Soberman, Philadelphia, both of Pa., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Oct. 19, 1982, Ser. No. 435,212
Int. Cl.³ G05B 19/40
U.S. Cl. 318—687 23 Claims

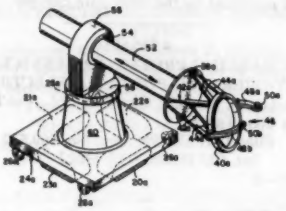
1. A self-propelled robot platform for cooperative use in connection with a support surface permitting magnetic interaction between the platform and the support structure comprising:

a frame;

a plurality of frame support members supported on the frame, adapted to cooperate with the support surface to support and space the frame from the surface and permit-

ting movement over the support surface in any selected direction;

at least two linear motor means fixed to the frame transversely to one another and generally parallel to the support surface in position to magnetically link the support surface or means generally conforming to the support surface such that, by a combination of signals to the respective transversely positioned motor means, the motor means can drive the platform in a variety of selected directions and along a selected path or pattern; and



tool support means including articulation structure permitting tool position adjustment, whereby a tool supported by the tool support means may do predetermined work at predetermined locations of the platform.

4,536,691

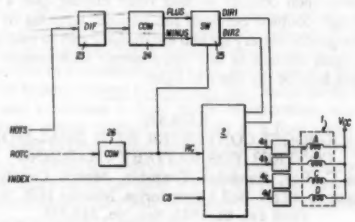
METHOD OF CONTROLLING A STEPPING MOTOR

Kenji Sakakibara, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation-in-part of Ser. No. 285,356, Jul. 20, 1981, abandoned. This application Sep. 26, 1983, Ser. No. 535,948

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **12 Claims**



1. In a system including a stepping motor having a plurality of phase windings and a rotor which is held in one of a plurality of stable stopping positions provided at intervals of one step, each of said stable stopping positions being defined by one of said phase windings, and means for driving said rotor responsive to the current rotational position of said rotor and the rotational speed of said rotor, a method comprising the steps of

sequentially energizing two selected phase windings which produce a magnetic field within a first rotational range relating to the current rotational position of said rotor, whereby said rotor is accelerated until it passes through the substantially middle point in the entire distance between a start position and a desired position,

sequentially energizing two selected phase windings which produce a magnetic field within a second rotational range relating to the current rotational position of said rotor, whereby said rotor is decelerated from a predetermined first position beyond said middle point to a second position where the rotational speed of said rotor drops to a predetermined value,

sequentially energizing a selected phase winding which produces a magnetic field within a third rotational range relating to the current rotational position of said rotor, whereby the rotational speed of said rotor is kept at substantially said predetermined value until said rotor arrives at a predetermined third position, in several steps, before said desired position,

selectively energizing two selected phase windings for a period determined by the rotational speed of said rotor in order to brake said rotor approaching said desired position, and

supplying a final drive signal to only one phase winding corresponding to said desired position in order to stop and hold said rotor at said desired position.

4,536,692

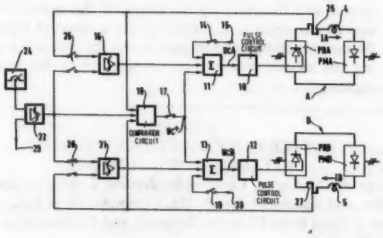
CIRCUIT FOR ENERGIZING AND CONTROLLING A SYNCHRONOUS ROTARY MACHINE OPERATING AT VARIABLE SPEED

Henri Godfroid, Valdoie, France, assignor to CGEE Alsthom, France

Continuation of Ser. No. 468,623, Feb. 22, 1983, abandoned. This application Jun. 21, 1984, Ser. No. 622,400

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—723 **5 Claims**



1. A circuit for energizing and controlling a synchronous rotary machine which operates at variable speed, said machine having a stator with a plurality of n polyphase windings wherein n is at least equal to two, said circuit comprising:

a polyphase AC source of n phases corresponding in number of the n polyphase windings of said machine,

controlled static switches comprising a static AC-AC converter for feeding each polyphase winding, each said converter constituting an autosynchronous inverter comprising a polyphase mains bridge and a polyphase machine bridge connected to each other by first and second DC conductors forming a continuous current loop such that one of said bridges operates as a rectifier and the other bridge operates as an inverter, each of said bridges having n parallel paths with paired thyristors within each of said parallel paths,

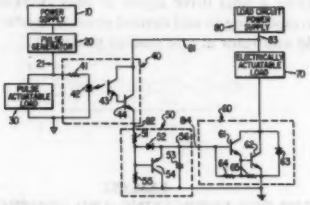
and wherein said polyphase AC source is connected to said polyphase mains bridge at points between said paired thyristors for respective phases, and said n polyphase windings of said machine stator are connected to respective paths of said polyphase machine bridge at points between said paired thyristors for respective phases thereof,

and wherein the circuit includes monitoring means for monitoring the sum of the currents flowing in each loop, and control means for controlling the mains bridge of each converter such that the sum of the DC currents in said conductors of all the converters is proportional to a reference average current value.

4,536,693
HIGH-SPEED CAPACITOR DISCHARGE CIRCUIT SUITABLE FOR THE PROTECTION OF DETONATION DEVICES

Albert J. Marek, Dallas, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Sep. 2, 1982, Ser. No. 414,105
Int. Cl.[3] H02J 15/00
U.S. Cl. 320—1 15 Claims



5. A circuit for storing electrical charge in response to a command signal from a current source, and for rapidly dissipating electrical charge upon termination of the command signal, comprising:

first, capacitive storage means for receiving and storing electrical energy from the command signal source;

second means, connected in parallel with the first means, for preventing discharge of the capacitive storage means during reception of a signal from the command signal source and for effecting discharge of the capacitive storage means upon termination of the command signal, the first means comprising means for storing power for actuating the second means upon termination of the command signal.

4,536,694
BATTERY-OPERATED DEVICE WITH WALL-MOUNTED SUPPORT

George W. McCarty, Lutherville; Jerome I. Rebold, Bartonsville, and Somers H. Smith, III, Columbia, all of Md., assignors to Solid State Chargers Research and Development, Lutherville, Md.

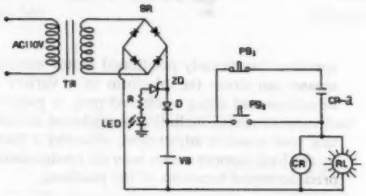
Filed Feb. 21, 1984, Ser. No. 581,774
Int. Cl.[3] H02J 7/00; H05K 7/20; H01M 45/04
U.S. Cl. 320—2 39 Claims

1. In a battery-operated device having a passive mode when the device is being charged and an active mode when the device is being discharged in use, the combination of a plate means, means for mounting the plate means on a wall, electrical outlet receptacle means associated with the plate means, means on the plate means for removably supporting the battery-operated device on the wall, charging means including a heat-producing solid state charger within the battery-operated device, the battery-operated device including an electrical cord connected to the charging means, and a plug on the end of the cord and having a pair of metal prongs for cooperation with the receptacle means in the charging mode of the battery-operated device, said solid state charger being within said plug and having heat sink means in effective thermal communication with at least one of said prongs for transferring and dissipating heat produced by the solid state charger.

4,536,695
DISCHARGING PROTECTION DEVICE FOR BATTERY-OPERATED PORTABLE ELECTRIC LIGHT

Ming-Hsin Lin, 4, La. 110, Shui-Nan Rd., Pei-Ten District, Taichung City, Taiwan

Filed Dec. 12, 1983, Ser. No. 560,532
Int. Cl.[3] H02H 7/18; H02J 7/00
U.S. Cl. 320—2 7 Claims



1. A discharging protection device for battery-operated portable electric light having a charging circuit combined with a transformer, a bridge rectifier and a zener diode circuit coupled with a rechargeable battery set thereof, comprising:

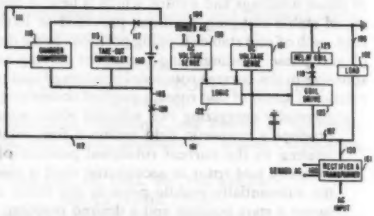
a relay circuit having a relay coil in parallel with the light bulb of the electric light and a normally-open relay contact connected to said light bulb;

a first switch connected between the positive terminal of the rechargeable battery set and a movable part of said normally-open contact of said relay circuit; and a second switch coupled between the positive terminal of the rechargeable battery set and a stationary part of said normally-open contact of said relay circuit with respect to the light bulb of the electric light.

4,536,696
BUCK-BOOST CONVERTER WITH DUAL-MODE CONTROL FOR BATTERY CHARGING

Richard C. Ray, Randolph Township, Morris County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 14, 1983, Ser. No. 513,775
Int. Cl.[3] H02J 7/10; H02M 7/00
U.S. Cl. 320—21 11 Claims



1. A battery charging circuit comprising

a flyback converter circuit including input means for accepting a source of energy and output means for accepting a battery to be charged,

charging control means for regulating charging of the battery including

a high-rate charge control providing a constant current for charging the battery and regulated by sensing a first current in a power switching device of the converter circuit,

a low-rate charge control providing a second current lower in value than the first current and which is controlled by a voltage responsive to a voltage level at the output means, and

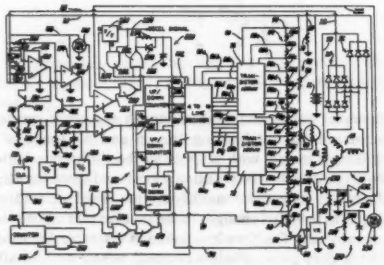
means for selecting when the low-rate charge control is active in response to a voltage level at the output means.

4,536,697

VEHICLE ELECTRICAL ENERGY MANAGEMENT SYSTEM

Ralph H. Johnston, Anderson; Curtis D. Munden, Carmel, and Leonard J. Sheldrake, Noblesville, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1983, Ser. No. 530,723
Int. Cl.³ F02B 67/04; H02J 7/14
U.S. Cl. 322—14 **4 Claims**



1. In a vehicle electrical system including a battery adapted to supply power to vehicle electrical loads and to be charged by an engine-driven generator, a regulator mechanism for controlling the output voltage of said generator, control means connected to the regulator mechanism effective in a charge mode of operation to control the generator output voltage as a function of the battery voltage and temperature, and float means effective when the charging current supplied to the battery during the charge mode of operation of said control means falls to a predetermined value indicative of a satisfactory state of battery charge to interrupt the charge mode of operation and to initiate a float mode of operation wherein the generator output voltage is reduced to a float value substantially equal to the nominal open circuit terminal voltage of said battery to avoid the energy consumption associated with continued charging of the battery from the engine-driven generator after a satisfactory state of battery charge has been reached, the improvement comprising:

engine deceleration responsive means connected to the regulator mechanism and effective during engine deceleration in excess of a reference amount for increasing the generator output voltage to a fixed, relatively high value to produce relatively high battery charging current to thereby recoup kinetic energy from the vehicle during deceleration;

current integrating means for measuring and indicating the net current into and out of the battery; and

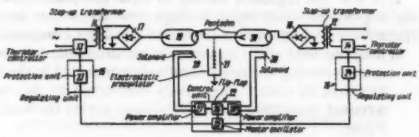
generator control means effective at the initiation of said float mode of operation for resetting said current integrating means and thereafter for adjusting the generator output voltage in relation to said float value in accordance with the net current measurement of said current integrating means such that the voltage is increased above said float value if the current integrating means indicates a net current out of the battery and decreased below said float value if the current integrating means indicates a net current into the battery, to thereby maintain the satisfactory state of battery charge existing at the initiation of said float mode of operation despite variable electrical loading and variable battery charging occasioned by engine deceleration.

4,536,698

METHOD AND APPARATUS FOR SUPPLYING VOLTAGE TO HIGH-OHMIC DUST ELECTROSTATIC PRECIPITATOR

Ilya S. Shevalenko; Anatoly V. Ilchenko; Vladimir I. Trush, all of Kharkov; Mikhail L. Vulis, Moscow; Anatoly I. Baryshnikov, Moscow; Igor P. Vereschagin, Moscow; Leonid M. Makalsky, Moscow; Garri Z. Mirzabekian, Moscow; Vladimir A. Smirnov, Moscow; Viktor P. Dzigan, Kharkov; Vladimir E. Ginzburg, Moscow; Vladimir I. Miroshnik, Moscow; Alexandr S. Minaev, Moscow; Alexandr V. Orlov, Moscow, and Sergei P. Teljupa, Kharkov, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Po Ochikh Tke Tekhnologichesky Gazov, Stochnykh Vod I Ispolzovaniju Vtorichnykh Energoresursov Predpriyaty Chernoi Metallurgii Vnipichermetenergoochist Ka, Kharkov, U.S.S.R.

Filed Aug. 25, 1983, Ser. No. 526,481
Int. Cl.³ B03C 3/68
U.S. Cl. 323—237 **11 Claims**



5. An apparatus for supplying voltage to a high-ohmic dust electrostatic precipitator having corona-forming and precipitation electrodes, comprising:

a step-up transformer having a primary winding connected to a supply line, and a secondary winding having one output terminal grounded;

a thyristor controller placed in series in the primary winding circuit of said step-up transformer, and having an input;

a switching device including:

a first transit pentode having a cathode lead and an anode lead, and a control solenoid whose axis is perpendicular to the axis of this transit pentode;

a second transit pentode having a cathode lead and an anode lead, said cathode lead of said second transit pentode being connected to the anode lead of said first transit pentode and a second terminal of the secondary winding of said transformer, and the anode lead of said second transit pentode being connected to the cathode lead of said first transit pentode, the common lead of said transit pentodes being connected to said corona-forming electrode of said electrostatic precipitator, and said second transit pentode having a control solenoid whose axis is perpendicular to the axis of this transit pentode;

a regulating unit incorporating a protection unit provided with a thyristor key and having a control electrode and a lead connected to said input of said thyristor controller; and

a control unit including:

a master oscillator having two outputs, one of said outputs being connected to said control electrode of said thyristor key of said protection unit in said control unit;

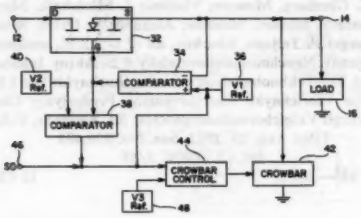
a flip-flop having an input connected to a second of the outputs of said master oscillator, and output; and

two power amplifiers, each having an input connected to one of the outputs of said flip-flop, and two outputs connected to a corresponding control solenoid of a respective pentode.

4,536,699
FIELD EFFECT REGULATOR WITH STABLE FEEDBACK LOOP

Richard H. Baker, Bedford, Mass., assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Jan. 16, 1984, Ser. No. 571,033
Int. Cl.[3] G05F 1/58
U.S. Cl. 323—276 2 Claims



1. A low loss regulator having an input terminal for receiving a predetermined input voltage and an output terminal operatively connected to a load, said regulator comprising:

at least one field effect transistor in a source follower configuration having its drain operatively connected to the input terminal, its source operatively connected to the output terminal, providing an output voltage across the load, and a gate;

means for comparing said output voltage to a first reference voltage and supplying a control voltage indiciative thereof to said gate, such that a change in current drawn by the load causes said means for comparing to produce a control voltage on said gate which keeps said output voltage substantially constant, said means for comparing comprises amplifier means for providing a high gain having a negative input operatively connected to the output terminal and a positive input operatively connected to said first reference voltage and an output operatively connected to said gate; and

means for clamping the output current drawn by the load to a predetermined value, said means for clamping operatively connected between said output of said high gain amplifier means and said positive input of said high gain amplifier means such that when said control voltage reaches a predetermined level said means for clamping outputs a voltage which modifies said first reference voltage and thereby prevents the load from drawing current more than said predetermined value.

4,536,700
BOOST FEEDFORWARD PULSE WIDTH MODULATION REGULATOR

Vincent G. Bello, and Charles W. Sweeting, both of Norwalk, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 28, 1984, Ser. No. 594,137
Int. Cl.[3] G05F 1/46
U.S. Cl. 323—285 7 Claims

1. A feedforward circuit including a circuit input and an output in a pulse width modulated power supply, comprising:

switching means including input, output and control sides, for passing power in successive on and off states;

inductive means including input and output sides, for maintaining a current throughout between said circuit input and output;

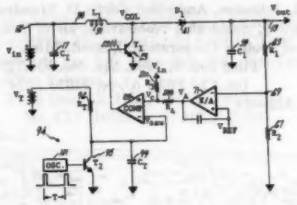
diode means for transferring current with respect to said inductive means, said diode and inductive means being electrically connected in series, and said diode means being reverse biased during the on states of said switching means;

capacitor means for storing charge, including respective output and grounded sides, the output side of said inductor and capacitor means being electrically connected at the circuit output;

sampling means for sampling a selected portion of the output voltage at said circuit output;

error means including an error output for establishing an error difference between said selected portion of said output voltage and a selected reference voltage;

sawtooth means for establising a sawtooth waveform of characteristic slope and peak amplitude;



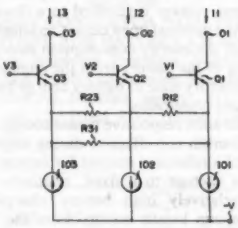
comparator means including sawtooth and error inputs and an output, for establishing the on and off times of said switching means with respect to the difference between the respective levels of said sawtooth and error inputs; and

feedforward means for modifying the level of said error output in terms of changes in the level at said circuit input, whereby said feedforward means is effective for modifying the duty cycle of said switching means without affecting the slope and peak amplitude of said sawtooth waveform.

4,536,701
VOLTAGE-CURRENT CONVERTING CIRCUIT

Katsumi Nagano, Shimonoseki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 3, 1982, Ser. No. 446,790
Claims priority, application Japan, Dec. 11, 1981, 56-199765
Int. Cl.[3] G05F 3/20
U.S. Cl. 323—315 6 Claims



1. A voltage-current converting circuit comprising:

at least three input transistors, the bases of said transistors receiving a multiphase voltage, the collectors of said transistors being connected to respective output terminals, and the emitters of said transistors being respectively connected to their own bases through voltage follower circuits;

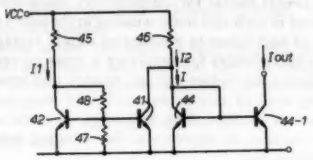
voltage-current converting means including a plurality of Δ-connection resistors, each of said resistors being connected between the emitters of two adjacent input transistors; and

current sources of the same number as said input transistors and connected to the emitters of said input transistors, respectively.

4,536,702
CONSTANT CURRENT SOURCE OR VOLTAGE SOURCE TRANSISTOR CIRCUIT

Katsumi Nagano, Shimonoseki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 5, 1983, Ser. No. 482,162
Claims priority, application Japan, Apr. 5, 1982, 57-55303
Int. Cl.³ G05F *3/20*
U.S. Cl. 323—316 **4 Claims**



1. A transistor circuit having first and second terminals driven by a power supply voltage applied across the terminals comprising:

first and second circuit portions connected in parallel between said first and second terminals, said first and second circuit portions responsive to said power supply voltage to cause respective first and second currents proportional to said power supply voltage when said power supply voltage exceeds respective first and second predetermined voltage levels wherein

said first circuit portion includes first, second and third resistor means connected in series between said first and said second terminal,

first transistor means having an emitter electrode connected to said second terminal, a base electrode connected between said second and third resistor means, and a collector electrode connected between said first and second resistor means,

said second circuit portion comprises

fourth resistor means having first and second ends, said first end being connected to said first terminal,

diode means connected in series between said second end of said fourth resistor means and said second terminal; and

circuit means connected to said first and second circuit portions for producing a differential current of said first and second currents, said circuit means including second transistor means having an emitter electrode connected to said second terminal, a base electrode connected to said base electrode of said first transistor means, and a collector electrode connected to said second end of said fourth resistor means.

4,536,703
METHOD AND APPARATUS FOR TESTING CABLE WIRE CONNECTED TO TERMINALS AT A REMOTE LOCATION

Ali N. Jabiway, Mt. Prospect, Ill., and Alexander M. Mitchell, Joppa, Md., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 27, 1982, Ser. No. 382,749
Int. Cl.³ G01R *19/00, 31/02, 15/12*
U.S. Cl. 324—52 **7 Claims**

1. A test system for ascertaining shorts between wires forming a cable, which comprises:

selector means for sequentially applying a ground condition on first ends of the wires;

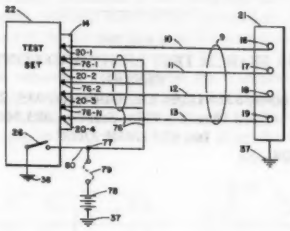
means rendered effective upon application of a ground condition on a wire for sequentially testing said first ends of the wires for the presence of a ground condition and generating a ground presence signal;

means responsive to said ground presence signal for generating an inhibit signal upon said testing means ascertaining a ground condition at one of the first ends of the wires;

means responsive to said inhibit signal for interrupting further operation of said sequential testing means;

means operative upon said test means ascertaining the application of a ground signal to the same wire that the selector means applies a ground condition for generating a blocking signal; and

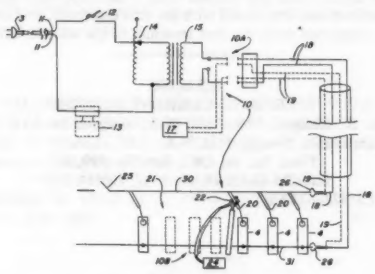
decision means rendered effective by said blocking signal for precluding generation of an inhibit signal by said inhibit signal generation means.



4,536,704
APPARATUS FOR IDENTIFYING DEFECTIVE SUBSTATION CAPACITORS

Merlin E. Burkum, Elmhurst, and Timothy M. O'Regan, Chicago, both of Ill., assignors to Commonwealth Edison Company, Chicago, Ill.

Filed Jan. 3, 1984, Ser. No. 567,780
The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—52 **13 Claims**



1. A method for testing an individual capacitor, which is part of a capacitor bank in a substation, for detecting faults in the capacitor without disconnecting the capacitor from the capacitor bank comprising the steps of:

a. applying an alternating voltage variable from 0 to 480 volts at 50/60 hertz of a predetermined magnitude to a capacitor bank, wherein the magnitude of the predetermined voltage is measured at the terminals of the capacitor bank;

b. measuring the value of the portion of total charging current entering the capacitor bank which enters the individual capacitor without disconnecting the individual capacitor from the capacitor bank by means of a split magnetic core probe having a distributed winding around the case and having an accuracy of about 3 percent of the true measured value; and

c. comparing the measured value of the charging current

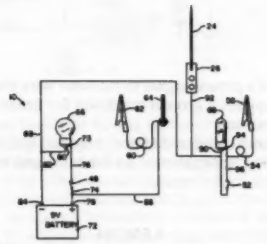
through the individual capacitor with the known allowable values for the individual capacitor reactive power rating for applied predetermined alternating voltage, thereby detecting an incipient fault in the capacitor tested when the measured charging current is outside the range of the known allowable value.

4,536,705

PROBE SEARCH TEST LIGHT AND CONTINUITY TESTER

John C. Hayes, 8316 Lages La., Baltimore, Md. 21206

Filed Mar. 27, 1984, Ser. No. 593,940
Int. Cl.³ G01R *31/00*
U.S. Cl. 324—53 **9 Claims**



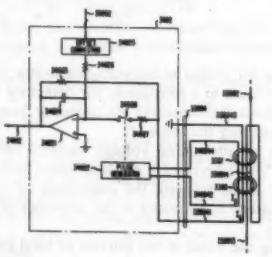
1. A system for continuity testing having: a housing, a battery with first and second electrodes in the housing, a first lamp with first and second terminals, first means for switching, means connecting the first lamp first terminal through the first means for switching to the battery first electrode, a second lamp with first and second terminals, a probe assembly, including a probe; means connecting the probe between the battery second electrode and the second lamp second terminal 90, a shunt circuit between said second lamp first and second terminals, second means for switching, connected in series with said shunt circuit; first and second leads with respective contacts, the second lead connected with the first electrode, and the first lead connected with the first terminal of the second lamp.

4,536,706

MAGNETIC CURRENT SENSOR

Kyran B. Kemper, Mendham, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 16, 1982, Ser. No. 399,182
Int. Cl.³ G01R *19/00, 1/02;* H04M *3/26*
U.S. Cl. 324—117 R **10 Claims**



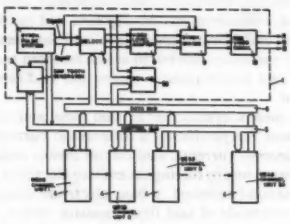
1. Circuitry for measuring a path current comprising
two magnetic structures (e.g., 3307,3308) with substantially identical hysteresis characteristics each having a line winding, a control winding and a sense winding,
means (34022) for providing control current pulses and for supplying said pulses to each said control winding to produce magnetic fields of opposite orientations in said structures,
means (330013) for coupling said path current to each said line winding,
said line winding and said control winding arranged on said structures to produce series-aiding field intensities in one of said structures and series-opposing intensities in the other of said structures in response to said path current and said control current, respectively,
means (34021,34024) for cumulatively integrating voltage induced in each said sense winding in the interval between each of said pulses to produce an output voltage,
means (34027,34028) for supplying a sense current, in proportion to said output voltage, to each said sense winding during each of said pulses, each said sense winding arranged to produce field intensities, in response to said sense current, to oppose said line winding induced field intensities, and
means (34025), coupled to said means for supplying, for reducing said output voltage to zero whenever said path is open-circuited to compensate for differences in said hysteresis characteristics.

4,536,707

METHOD AND APPARATUS FOR DISPLAYING ONE OR MORE MEASUREMENT VALUES OF ARBITRARY MEASUREMENT VARIABLES ON A SCREEN

Arnulf Herweg, Grillenweg 44, D-8501 Feucht, Fed. Rep. of Germany

PCT No. PCT/DE82/00010, § 371 Date Sep. 14, 1982, § 102(e) Date Sep. 14, 1982, PCT Pub. No. WO82/02431, PCT Pub. Date Jul. 22, 1982
PCT Filed Jan. 14, 1982, Ser. No. 420,247
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1981, 3100986
Int. Cl.³ G01R *13/20*
U.S. Cl. 324—121 R **36 Claims**



1. A method for displaying one or more measurement values of arbitrary measurement variables on the screen of a video display terminal (VDT) operating by the line-scanning process, in particular a color VDT, in which line-frequency pulses and frame-frequency pulses are generated in a synchronizing pulse generator, the method comprising:
generating a measurement voltage (Ux) corresponding to a measurement variable;
standardizing said measurement voltage in a measurement voltage amplifier;
simultaneously supplying said standardized measurement voltage and a sawtooth voltage to an adding amplifier;
synchronizing the sawtooth voltage (Us) by the frame-frequency or line-frequency pulses;
supplying the output voltage of the adding amplifier to a threshold switch;
causing said switch to emit a time-proportional signal if the threshold value is exceeded by the summed voltage;
sending the resulting signal proportional to the measurement voltage to a subsequent gate circuit synchronized with the line-frequency or frame-frequency pulses; and

sending said proportional signal, after level adaptation and synchronizing pulse mixing, to the VDT as a video signal.

4,536,708

APPARATUS FOR OBTAINING AN INFORMATION ON THE MOTION OF A MOVING ELEMENT, PREFERABLY FOR ROTATIONAL SPEED OF A ROTATING ELEMENT IN AN AUTOMOBILE

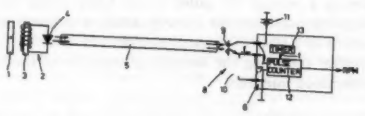
Arthur Schneider, Braunschweig, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Continuation of Ser. No. 380,247, May 20, 1982, abandoned. This application Aug. 10, 1984, Ser. No. 640,203

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1981, 3126023

Int. Cl.³ G01P *3/48*

U.S. Cl. 324—174 **1 Claim**



1. Apparatus for determining accurately the speed of a moving element at a remote location over a broad range of speeds without interference from electrical noise signals comprising permanent magnet means rigidly attached to the element, Wiegand sensor means positioned adjacent to the moving element and responsive to passage of the permanent magnet means during motion thereof in the absence of an electrical energy source to generate an electrical pulse having a width which is independent of the speed of the element so as to provide a series of signals having a frequency directly proportional to the speed of the element;

light emitting diode means for converting individual electrical pulse signals produced by the sensor means into corresponding light pulse signals;

a fiber-optical light guide arranged to transmit said light pulse signals through a region subjected to electrical noise signals to a remote detector means;

detector means responsive to individual light pulse signals from said fiber-optical light guide to provide corresponding individual electrical pulse signals; and

signal evaluation means for determining the frequency at which the individual electrical pulse signals are produced by the detector means and thereby determining the speed of the element.

4,536,709

DETECTING DEVICE HAVING SPACED TRANSMITTING AND RECEIVING COILS FOR DETECTING A METAL STRIP EMBEDDED IN PAPER MONEY

Tsuyoshi Ishida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 326,340, Dec. 1, 1981, abandoned. This application Aug. 29, 1984, Ser. No. 645,533

Claims priority, application Japan, Jan. 12, 1981, 56-2043; Apr. 2, 1981, 56-48400; Jun. 29, 1981, 56-99620

Int. Cl.³ G01N *27/72*; G01R *33/12*; G06K *7/08*

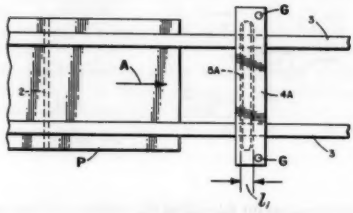
U.S. Cl. 324—239 **13 Claims**

1. A detecting device for detecting a sheet of genuine paper money having a longer dimension and a shorter dimension, the sheet including an embedded metal strip having a length substantially equal to the shorter dimension of the sheet and a predetermined width, the strip being oriented within the sheet so that its length is substantially parallel to the shorter dimension of the sheet, said detecting device comprising:

transporting means for rapidly transporting the sheet in the direction of its longer dimension along a transportation path;

an electric transmitting coil adjacent one side of the transportation path having a long and narrow shaped plane and having a width larger than the predetermined width of the strip, the long dimension of said long and narrow shaped plane being oriented substantially parallel to the shorter dimension of the sheet as the sheet is transported along the transportation path;

an electric receiving coil adjacent the transportation path directly opposite said transmitting coil having a long and narrow shaped plane and positioned in spaced parallel relationship to said transmitting coil along the transportation path, said receiving coil having a width larger than the predetermined width of the strip, wherein the sheet is transported between said transmitting coil and said receiving coil with the surface of the sheet being parallel to the shaped planes of said coils;



AC current supply means for supplying AC current to said electric transmitting coil to generate a magnetic field;

a capacitor connected to said electric receiving coil in a resonance circuit which generates a resonance signal; and

detecting means connected to said resonance circuit for detecting variations in the resonance signal of said resonance circuit caused by eddy current losses in said metal strip when said metal strip passes between said transmitting and receiving coils.

4,536,710

MAGNETIC DETECTOR INSTRUMENT WITH BOARD-MOUNTED SENSOR ASSEMBLY

Warren D. Dunham, McLean, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed Aug. 10, 1982, Ser. No. 406,887

Int. Cl.³ G01R *33/02*; H05K *7/08*; H01F *15/02*

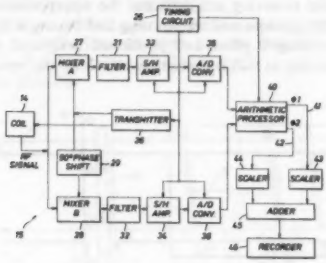
U.S. Cl. 324—244 **6 Claims**

1. A magnetic detector instrument comprising a substantially planar elongate circuit board supporting electronic components of the instrument and constituting a sensor support, an elongate magnetic sensor assembly having a magnetic axis along its length, and means mounting the sensor assembly on the support including a slot having an open end at one end of the support and a pair of opposed longitudinally extending external grooves formed in the sensor assembly, said sensor assembly fitting longitudinally into said slot through its open end, with the magnetic axis along the length of said circuit board and with slot-defining edge portions of the support received in the respective grooves whereby the sensor assembly is retained in the slot.

4,536,711
METHOD AND APPARATUS FOR MEASURING FLOW IN A PIPE OR CONDUIT

James D. King, and Erroll S. Riewerts, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed May 5, 1983, Ser. No. 491,868
Int. Cl.[3] G01R 33/08
U.S. Cl. 324—306 39 Claims



1. An apparatus for measuring the velocity of flow in a pipe of a material having an adequate population of a selected element comprising:

(a) magnet means for forming a magnetic field perpendicular to the flow of the element of interest in the pipe, the field having a gradient in the direction of flow;

(b) coil means forming a field at right angles to the magnetic field formed by said magnet means;

(c) transmitter means connected to said coil, said transmitter means being adapted to form and apply to said coil means a signal having a frequency related to a first magnetic field intensity to accomplish a resonant relationship between the magnetic field transmitted signal, and the element of interest;

(d) receiver means for detecting magnetic resonance signals from the element of interest flowing through said coil means, said receiver means forming an output signal of detected signals;

(e) detector means connected to said receiver means for measuring the change in the detected signals from said receiver means and indicating flow velocity of the element of interest as indicated by the change in the detected signals; and

(f) timer means for operating said transmitter means to form a pair of spaced transmitted pulses, and wherein said receiver means receives echoes from the element of interest.

4,536,712
METHOD AND APPARATUS FOR EXAMINATION BY NUCLEAR MAGNETIC RESONANCE

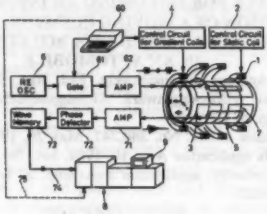
Hideto Iwaoka; Kenji Fujino; Tadashi Sugiyama, and Hiroyuki Matsuura, all of Musashino, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Sep. 1, 1983, Ser. No. 528,599
Claims priority, application Japan, Sep. 9, 1982, 57-157274
Int. Cl.[3] G01R 33/08
U.S. Cl. 324—309 7 Claims

1. An examination method utilizing a nuclear magnetic resonance technique in which the body of a subject to be examined is placed in an uniform static magnetic field and subjected to an electromagnetic wave having a frequency which induces nuclear magnetic resonance, a magnetic field is also applied to the subject body to specify an area of the body from which nuclear magnetic resonance (NMR) signals are radiated, and such nuclear magnetic resonance signals from the specified body area are received, the method comprising the steps of:

applying a first 90° pulse as the electromagnetic wave to the body to excite the same;

then applying a 180° pulse to the body to produce an echo signal;



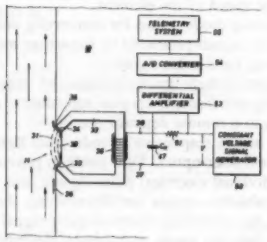
applying a second 90° pulse to the body when said echo signal is maximum to thereby allow a magnetization to return to a state of thermal equilibrium; and

thereafter repeating the foregoing sequence of the steps at prescribed intervals.

4,536,713
ELECTRICAL RESISTIVITY MEASUREMENT OF A FLOWING DRILLING FLUID USING EDDY CURRENTS GENERATED THEREIN

Mark H. Davis; Richard A. Meador, both of Spring, Tex., and Macmillan M. Wisler, Lafayette, La., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,879
Int. Cl.[3] G01V 3/26; G01N 27/74; E21B 49/00
U.S. Cl. 324—324 25 Claims



1. Apparatus for measuring the electrical resistivity of fluid within a borehole comprising:

a. a housing disposable along a pipe string in such a borehole;

b. said housing being formed with a sensor region in the outer surface thereof, said sensor region having a pair of generally opposed wall end portions and being adapted to be substantially and continuously filled by fluid flowing along the outer surface of the housing;

c. a high permeability magnetic core having a pair of opposed ends forming a gap region therebetween, said core being positioned within said housing and having its respective ends positioned adjacent to said opposed wall portions of said sensor region to position said sensor region within said gap of said core;

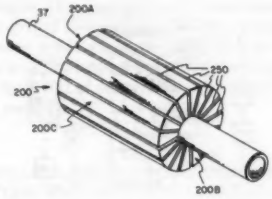
d. means for producing an alternating, electromagnetic flux field of a substantially constant magnitude in said core and said gap region to induce eddy currents in fluid in said sensor region; and

e. means for generating a signal corresponding to fluctuations in the electromagnetic flux field in said core to measure the electrical resistivity of fluid flowing along the outer surface of said housing.

4,536,714
SHIELDS FOR ANTENNAS OF BOREHOLE LOGGING DEVICES

Brian Clark, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 368,922
Int. Cl.³ G01V 3/30; H01Q 1/52
U.S. Cl. 324—338 32 Claims



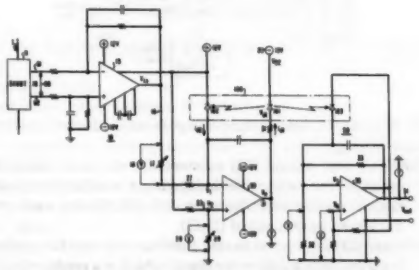
1. For use in conjunction with a borehole logging device wherein transmitting and receiving antennas, which transmit or receive electromagnetic energy having transverse magnetic components and transverse electric components, are mounted on a support means which includes a central electrically conductive pipe; a shield for an antenna of said device, comprising:

a hollow closed-ended body joined at its ends to the electrically conductive pipe of said support means and surrounding said antenna, said body being formed of an electrically conductive material generally in the shape of a surface of revolution and having a series of substantially equally spaced slots therein, each slot extending radially outward from said support means along a plane which passes substantially through the axis of said support means, so as to divide said body into a number of conductive sections each of which forms a closed conductive path with said conductive pipe, whereby said conductive paths are operative to prevent passage of transverse magnetic components through said shield, but to allow transverse electric components through the slots of said shield.

4,536,715
LINEAR DUAL DETECTOR OPTO-ISOLATOR CIRCUIT

Brian A. Basarath, Parsippany, and Robert J. Kakalec, Madison, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 5, 1983, Ser. No. 558,286
Int. Cl.³ H03F 17/00
U.S. Cl. 330—2 8 Claims



1. In an amplifier circuit arrangement having at least an input amplifier, an output amplifier each having inverting and noninverting inputs and a dual detector opto-isolator including a light-emitting diode and first and second light detecting diodes and providing ground isolation between the input and output amplifier, the input amplifier circuit having an amplification gain operative for compensating for different current transfer and contrast ratios in the opto-isolator, calibration to set the amplification gain comprising the steps of

(1) setting a voltage at an inverting input of the input amplifier to a zero value,

(2) measuring a voltage at the noninverting input of the output amplifier,

(3) adjusting a voltage at the noninverting input of the input amplifier according to the relation

$$V_2 = KV_4 - 1$$

where K is one half an inverse of a ratio of an output voltage of the output amplifier to a voltage at its inverting input, and

V_2 is a voltage at a noninverting input of the input amplifier, and

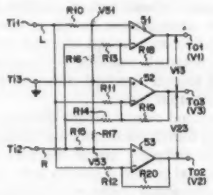
V_4 is a voltage at a noninverting input of the output amplifier, and

(4) adjusting the voltage at the inverting input of the input amplifier until an output voltage of the output amplifier equals a preselected fixed value.

4,536,716
STEREO AMPLIFIER CIRCUIT FOR BICHANNEL SIGNALS

Yoshihiro Yoshida, Yokohama, and Hidehiko Aoki, Fujisawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 12, 1983, Ser. No. 560,114
Claims priority, application Japan, Dec. 13, 1982, 57-218059
Int. Cl.³ H03F 3/45
U.S. Cl. 330—69 17 Claims



1. A stereo amplifier circuit comprising:

first circuit means responsive to a first input signal and to a second input signal, for generating a first output signal which corresponds to the potential difference between said first input signal and said second input signal;

second circuit means responsive to said first and second input signals, for generating a second output signal which corresponds to the potential difference between said second input signal and said first input signal;

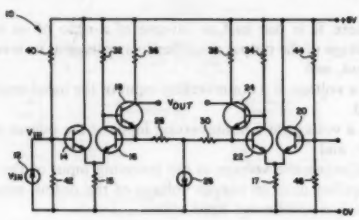
third circuit means responsive to said first and second input signals, for generating a third output signal which corresponds to the sum of said first and second input signals, said third output signal containing signal components being antiphase to said first and second input signals; and

output circuit means coupled to said first to third circuit means, for providing a first differential output signal corresponding to the potential difference between said first and third output signals, and providing a second differential output signal corresponding to the potential difference between said second and third output signals.

4,536,717
COMPENSATED INVERTING/NONINVERTING DIFFERENTIAL AMPLIFIER

Raymond C. Hauge, Fox River Grove, and Victor G. Mycynek, Des Plaines, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 3, 1983, Ser. No. 538,291
Int. Cl.³ H03F 3/45
U.S. Cl. 330—254 4 Claims



1. An inverting/noninverting differential amplifier comprising:

first and second matched transistor pairs each including an interconnected common terminal, an output terminal, and an input terminal to which are provided respective input signals with the input signal provided to the second matched transistor pair being maintained at a constant reference voltage, and wherein said input signals are amplified and provided to respective output terminals;

third and fourth transistors respectively coupled to said first and second matched transistor pairs and responsive to the amplified input signals produced therein for respectively generating inverted and non-inverted output signals proportional to the difference between said respective input signals, said third and fourth transistors each including a base element coupled to a respective output terminal of said first and second matched transistor pairs, a collector element from which said inverted and non-inverted output signals are derived, and an emitter element coupled in a feedback arrangement to the common terminal of a respective first and second matched transistor pair;

a resistive network coupling the common terminals of said first and second matched transistor pairs;

a common output load;

first and second switch means coupled respectively to said third and fourth transistors and responsive to a switching signal for coupling either the inverted or non-inverted output signal to said common load; and

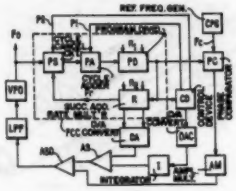
a coupling capacitor connecting said first matched transistor pair and said fourth transistor for phase compensating said inverted and non-inverted output signals coupled to said common load by varying the phase of said non-inverted output signal to match that of said inverted output signal.

4,536,718
JITTER REDUCTION CIRCUIT FOR FREQUENCY SYNTHESIZER

Michael J. Underhill, Faygate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,660
Claims priority, application United Kingdom, Mar. 15, 1982, 8208095
Int. Cl.³ H03L 7/18
U.S. Cl. 331—16 10 Claims

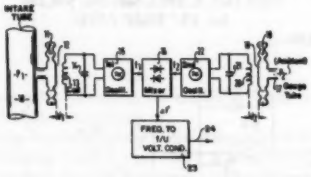
1. A frequency synthesizer comprising a reference frequency generator, a frequency control circuit which includes programmable frequency reduction means comprising a cycle cancellation circuit arranged to cancel a cycle of a frequency to be reduced by the frequency reduction means for each input pulse to said cancellation circuit from a pulse source, and a jitter compensation signal circuit connected to the frequency control circuit, the output signal of the jitter compensation signal circuit being arranged to compensate, at least partly, for any jitter in the period of the output frequency of the synthesizer that would otherwise be caused as a result of each cancelled cycle, characterised in that the synthesizer further includes a control device the control signal output of which is arranged to cause the frequency control circuit to cancel cycles from, and also to add cycles to, the frequency to be reduced at a given combined rate, and a control signal compensation circuit connected to the control device and arranged to produce an output signal which is a function of the control signal, the output of the control signal compensation circuit being so connected in the synthesizer circuit as to compensate for any jitter in the output frequency of the synthesizer that would otherwise be caused by the control signal.



4,536,719
INDUCTIVE PRESSURE SENSOR USING TWO OSCILLATORS

Helmut Baum, Stuttgart; Heinz Pfizenmaier, Leonberg; Ewald Schmidt, Ludwigsburg, and Franz Strauss, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP81/00073, § 371 Date Jan. 28, 1982, § 102(e) Date Jan. 28, 1982, PCT Pub. No. WO82/01067, PCT Pub. Date Apr. 1, 1982
PCT Filed Jun. 12, 1981, Ser. No. 346,047
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035186
Int. Cl.³ H03B 21/00
U.S. Cl. 331—37 11 Claims



1. A compact, temperature-compensated inductive pressure sensor having

first (15) and second (22) substantially identical, thermally coupled but otherwise independent oscillator circuits, each including an inductance coil (13,20), and each producing an output signal (f1,f2);

a mixer (23) connected to said oscillator circuits for producing a frequency difference signal which is a predetermined function of the output signals of said oscillator circuits;

wherein, in accordance with the invention,

said first oscillator (15) includes a variable inductance electromagnetically responsive to the position of a diaphragm, said diaphragm forming a part of a pressure measurement chamber (11);

said second oscillator (22) includes a variable inductance electromagnetically responsive to the position of a dia-

phragm, said diaphragm forming a part of a reference pressure chamber (28);

said coils (13,20), forming a part of said oscillator circuits (15,22), are formed as flat films, and

at least one (13) of said inductance coils is a variable inductance, said compact pressure sensor including

a diaphragm (12) disposed at a variable distance (d1) from said one coil (13),

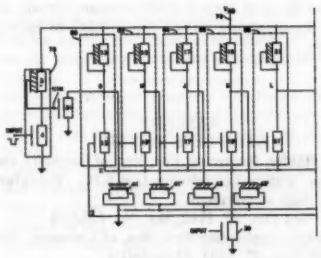
said diaphragm (12) being deflectable in accordance with the pressure (p1) to be sensed and having a layer of material (12) thereon which affects the inductance of the coil (13), and whose deflection thereby affects the frequency of the output signal (f1) of the oscillator circuit (15) of which it forms a part.

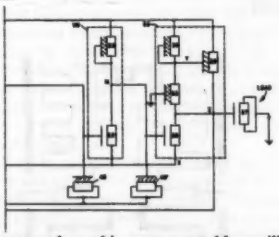
4,536,720

PROGRAMMABLE OSCILLATOR WITH POWER DOWN FEATURE AND FREQUENCY ADJUSTMENT

Hayden C. Cranford, Jr., Apex, and Stacy J. Garvin, Durham, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,451
Int. Cl.³ H03K *3/354*
U.S. Cl. 331—57 **4 Claims**





1. An improved on-chip programmable oscillator comprising:

an input node;

an output node operable for attaching to a load;

a first means coupled between the input and output node and operable for setting the circuit delay and the frequency of oscillation;

a second means connected to the input node and operable for causing instability at the input node so as to initiate oscillation;

a third means responsive to an enabling signal and operable for supplying a control signal to the second means;

a feedback path interconnecting the output node to the first means and operable for ensuring the continuity of the oscillation;

a fourth means operable to form a single conductive path between the first means and ground; said fourth means being responsive to an enabling signal and operable for disrupting the conductive path periodically; and

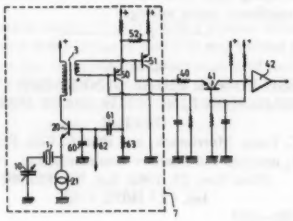
a load means coupled to the output node and operable for providing the largest proportion of the circuit delay thereby enabling the frequency of said oscillator to track the switching speed of said load.

4,536,721

LOW NOISE CRYSTAL OSCILLATOR

Roger Charbonnier, Meudon Bellevue, France, assignor to Adret Electronique, France

Filed Apr. 9, 1984, Ser. No. 597,879
Claims priority, application France, Apr. 20, 1983, 83 06782
Int. Cl.³ H03B *5/36*
U.S. Cl. 331—116 R **4 Claims**



1. An oscillator comprising:

a crystal resonator;

active coupling circuit means having first and second inputs and an output, the first input being connected to the crystal resonator;

a current booster transformer having primary and secondary windings, the primary winding being connected to the output of the coupling circuit means;

output amplifier means connected in series with the secondary winding;

amplitude limiting amplifier means connected in parallel across the secondary winding said amplitude limiting amplifier means having an output; and

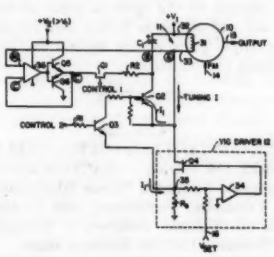
band-pass filter means connecting the output of said amplitude limiting amplifier means to the said second input.

4,536,722

APPARATUS FOR RAPIDLY SWITCHING A CONTROLLED SIGNAL SOURCE AND METHOD THEREFOR

Lawrence A. Kaye, Walnut Creek, and Robert Mayer, Oakland, both of Calif., assignors to Giga-Tronics, Inc., Pleasant Hill, Calif.

Filed Jun. 23, 1982, Ser. No. 391,229
Int. Cl.³ H03L *7/00*
U.S. Cl. 331—117 D **7 Claims**



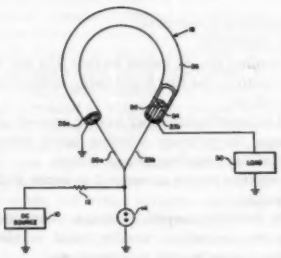
1. In a microwave frequency signal generator having an oscillator which requires capacitive filtering means to reduce noise, said oscillator being driven and tuned by a constant current source so that the output frequency of said oscillator is

proportional to the current from said constant current source:
a pair of current inputs for said oscillator connected to said constant current source;
means included in said current source for changing the magnitude of said current and therefore the output frequency of said oscillator;
switching means for selectively connecting said filtering means across said input pair and disconnecting said filtering means during a said frequency change; and
comparator means for sensing the voltage across said oscillator input pair, comparing the oscillator input voltage with the voltage across said filtering means, and charging or discharging said filtering means to substantially match said oscillator input voltage.

4,536,723
HIGH-POWER PULSE GENERATOR USING TRANSMISSION LINE WITH SPARK DISCHARGE DEVICE

Stephen C. Lang, Merrimack, and Paul E. Gili, Brookline, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 25, 1983, Ser. No. 555,095
Int. Cl.³ H03K *3/02*
U.S. Cl. 331—127 **4 Claims**



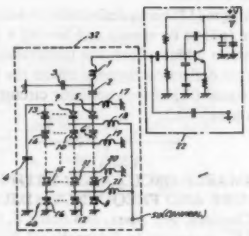
1. A pulse generator comprising:
A. a transmission line having first and second conductors, each of which has first and second ends,
B. a spark discharge device having first and second terminals, the first terminal of said discharge device being connected to said first end of said second transmission line conductor and said second terminal of said discharge device being connected to said first and second ends of said first transmission line conductor,
C. a voltage source connected to apply a charging voltage to said first and second conductors to charge the capacitance between said conductors, whereby said capacitance repetitively charges to the ignition point of said discharge device and said discharge device then discharges to provide an output pulse at said second end of said second transmission line conductor.

4,536,724
VOLTAGE-CONTROLLED OSCILLATOR HAVING THREE OR MORE VARACTOR DIODES

Makoto Hasegawa, Kawasaki; Mitsuo Makimoto, Yokohama; Sadahiko Yamashita, Sagamihara, and Yoshio Katayama, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Company Limited, Kadoma, Japan

Filed Dec. 21, 1982, Ser. No. 451,838
Claims priority, application Japan, Dec. 21, 1981, 56-207662
Int. Cl.³ H03B *5/08*
U.S. Cl. 331—177 V **11 Claims**

1. A voltage-controlled oscillator having a non-switching continuous frequency band, comprising:
(a) an oscillating circuit;
(b) a series circuit of a coupling capacitor and a resonant circuit coil, connected to said oscillating circuit;
(c) a series circuit of three or more varactors, which series circuit is connected via said series circuit of said coupling

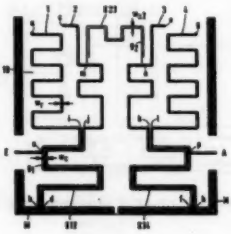


capacitor and said resonant circuit coil to said oscillating circuit so far as to form a series resonant circuit; and
(d) means for supplying a D.C. bias voltage to each of said varactors.

4,536,725
STRIPLINE FILTER

Bodo-Hagen Hübler, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1982, Ser. No. 436,038
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147055; Nov. 27, 1981, 8134636[U]
Int. Cl.³ H01P *1/203, 7/08, 3/08, 5/18*
U.S. Cl. 333—204 **16 Claims**

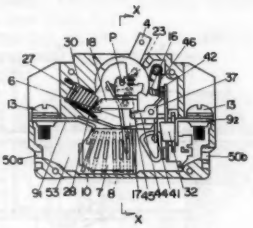


1. A stripline filter for operation at a predetermined frequency and having a predetermined bandwidth, comprising:
an insulating substrate having a ground conductor affixed thereto;
at least first and second tuned stripline resonators secured to a surface of said substrate and electrically connected to said ground conductor, each of said tuned stripline resonators comprising a conductor resonating at one-quarter of the wave length corresponding to said predetermined frequency; and
a directional stripline coupler having first and second spaced conductors, at least the first conductor of said directional stripline coupler being formed of a part of said first tuned stripline resonator conductor and having an electrical length which is substantially less than the total length of said first tuned resonator.

4,536,726
CIRCUIT BREAKER

Hisamoto Hideo, Owariasahi, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

PCT No. PCT/JP83/00025, § 371 Date Sep. 29, 1983, § 102(e) Date Sep. 29, 1983, PCT Pub. No. WO83/02679, PCT Pub. Date Aug. 4, 1983
PCT Filed Jan. 29, 1983, Ser. No. 551,991
Claims priority, application Japan, Jan. 30, 1982, 57-13625
Int. Cl.³ H01H *75/12*
U.S. Cl. 335—23 **3 Claims**



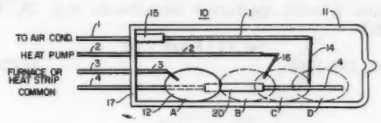
1. A circuit breaker comprising:
a housing having two external terminals;
a handle projecting from and pivotally connected to said housing;
a movable contactor pivotally connected to said handle through a first spring means, and electrically connected to one of said external terminals and carrying a movable contact;
a stationary contactor electrically connected to the other said external terminal and having a stationary contact with which or from which said movable contact is brought into contact or disconnected;
a movable frame which is disposed movably within said housing and a latch member capable of interlocking said movable frame with said movable contactor, said latch member being disposed movably within said housing;
a second spring means normally subjecting the latch member to a spring load so as to engage said movable frame, thereby fixing said movable frame in an operable position;
an abnormality detection mechanism positioned within said housing with respect to said latch member to release said latch member and said movable frame upon detection of an abnormality; and
a third spring means normally biased against said movable frame and positioned to separate said latch member from said movable frame and to apply a spring load with respect to said movable frame to cause disconnecting of said movable contactor from said stationary contactor by moving in the same direction as the usual opening thereof following movement of said movable frame from said operable position.

4,536,727
MULTIPLE POLE MERCURY SWITCH PARTICULARLY ADAPTED FOR THERMOSTAT APPLICATIONS

Robert P. Romano, Glen Ridge, N.J., assignor to Comus International Corp., Nutley, N.J.

Filed Jun. 4, 1984, Ser. No. 616,653
Int. Cl.³ H01H *29/22*
U.S. Cl. 335—54 **20 Claims**

1. A mercury switch comprising a hollow housing of a longitudinal tubular configuration and when positioned in the horizontal plane having a first closed end and a base end with a first long electrode disposed in said housing relatively parallel to said horizontal plane with said electrode extending from said base, a second shorter electrode positioned above said first electrode, within said housing and extending from said base, a third electrode above said second of a length longer than said second and shorter than said first positioned in said housing and extending from said base, and a fourth electrode positioned above said third electrode and extending from said base, with a charge of mercury in said housing hollow such that when said switch is tilted with respect to said plane, said mercury can

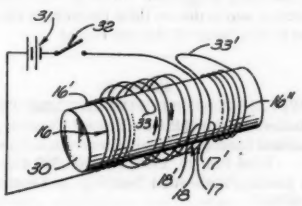


alternately make contact in four distinct modes, where in a first mode contact is made between said first and second electrodes, in a second mode contact is made between said first and third electrodes, in a third mode contact is made between said first, third and fourth electrodes and in a fourth mode contact is made between said first and fourth electrodes.

4,536,728
VALVE SOLENOID WINDINGS

Luc P. Cyrot, Mission Viejo, Calif., assignor to International Telephone & Telegraph Corp., New York, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,236
Int. Cl.³ H01H *9/00*
U.S. Cl. 335—182 **4 Claims**



1. A solenoid comprising:
a first winding in an inner first layer;
a second winding in an outer second layer partially surrounding said first winding in said inner first layer;
a third winding in one of said first and second layers wherein said third winding having an equal number of turns as said second winding and a fewer number of turns than said first winding, at least one of said second winding and said third winding being wound reverse of said first winding for effectively cancelling an equivalent layer of said first winding and for reducing the number of active coils of said first winding, said second winding and said third winding being joined by a bifilar winding; and
means actuable to energize all three of said windings in a manner to cause a magnetic field produced by one of said first and second and third windings to cancel at least a portion of a magnetic field produced by another of said first and second and third windings and wherein said bifilar winding being comprised of a wound length of wire folded in a loop beyond said active turns of said first winding wherein said magnetic field produced by each wire of said second and third windings will cancel said magnetic field produced by each adjacent wire of each of said first and second layers, each of said first winding and said second winding and said third winding being electrically connected in series.

4,536,729
ELECTROMAGNETIC DEFLECTION UNIT AND PICTURE TUBE PROVIDED WITH SUCH A UNIT

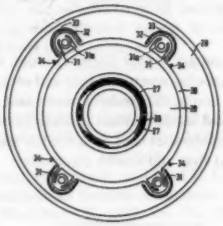
Halbe Osinga, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 18, 1984, Ser. No. 651,750

Claims priority, application Netherlands, Sep. 23, 1983, 8303267

Int. Cl.³ H01F 7/00

U.S. Cl. 335—210 11 Claims



1. In an electromagnetic deflection unit for a picture tube, said deflection unit having deflection coils which are carried by a conical coil holder of synthetic material, a conical ring of soft magnetic material cooperating with the coils, and the coil holder having a flange at its wide end and the conical ring being secured at its wide end to the flange of the coil holder, the improvement wherein the conical ring is enclosed at its wide end in a moulded-on ring of synthetic material which has laterally extending projections which are distributed along its circumference, and in that on these projections the conical ring is secured to the flange of the coil holder.

4,536,730
DEFLECTION UNIT FOR PICTURE TUBES

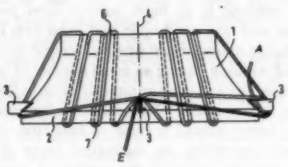
Ulrich Hafner, Möckmühl, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 15, 1984, Ser. No. 580,455

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306385

Int. Cl.³ H01F 5/00

U.S. Cl. 335—213 2 Claims



1. A deflection yoke comprising:

a toroidal core comprising two symmetrical halves of soft magnetic material, each core halve having at least three projections for forming redirecting points for a winding wound thereon;

a winding on each of said core halves;

each said winding comprising two winding halves, said two winding halves being arranged such that they do not overlap and are symetrically positioned relative to an imaginary plane which bisects both said core halves, said imaginary plane lying in the longitudinal axis of said toroidal core, said two winding halves being both wound from the center of the core half toward the respective ends of said core half.

4,536,731
ELECTRIC CONTROL MOTOR

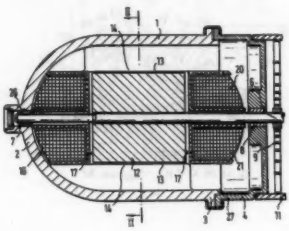
Hans Kubach, Korntal-Münchingen; Ulrich Kemmner, Stuttgart, and Gerold Grimm, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 423,920

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1982, 3223557

Int. Cl.³ H01F 7/08

U.S. Cl. 335—272 2 Claims



1. An electric control motor comprising a housing of ferromagnetic material, said housing being provided with an electromagnetic coil and an armature, said armature being associated with poles provided in said housing and further being rotatable in opposition to a return force, said housing further comprising a cup-shaped housing bottom, having an open end and a cap for sealing said open end, said electromagnetic coils include at least two interconnected, oppositely disposed coil portions which are mounted in coil retainers which can be interlocked together within said housing so as to confront extremities of said armature and axially disposed within said housing with respect to said armature, said armature being disposed on a shaft axially of said housing and further that said shaft is supported in said cap and said housing bottom, said chamber being defined by said poles, an inner wall of said housing and said electromagnetic coil.

4,536,732
MAGNETIC COUPLING FOR PARTS OF AN OPTICAL INSTRUMENT

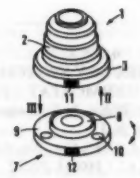
Klaus Schindl, and Georg Nyman, both of Vienna, Austria, assignors to C. Reichert Optische Werke AG, Vienna, Austria

Filed May 21, 1984, Ser. No. 612,156

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319466

Int. Cl.³ H01F 7/20

U.S. Cl. 335—285 9 Claims



1. A magnetic coupling for an optical instrument comprising (1) a first member, at least one magnetized body in said first member; (2) a second member, at least one magnetizable body in said second member; said members being movable between a first magnetically uncoupled position in which bodies of the respective members are displaced from one another, and a

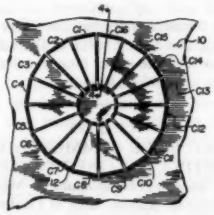
second magnetically coupled position in which the bodies of the respective members are adjacent to one another; and (3) means for aligning the respective members in the first magnetically uncoupled position, wherein the members are movable between the first and second positions in a manner such that respective surfaces of the members slide over one another.

4,536,733

HIGH FREQUENCY INVERTER TRANSFORMER FOR POWER SUPPLIES

Randolph D. Shelly, Rosemere, Canada, assignor to Sperry Corporation, New York, N.Y..

Filed Sep. 30, 1982, Ser. No. 430,534
Int. Cl.³ H01F *27/30*
U.S. Cl. 336—182 **12 Claims**



1. In a low leakage inductance high frequency transformer of the type having a toroidal core about a central axis normal to the plane thereof, with a first winding distributed thereon, the toroidal core supported by a printed circuit board having a pattern of holes drilled therein and predetermined patterns of electrical interconnection between said holes for forming a second winding with a predetermined turns ratio about the toroidal core, the improvement wherein said second winding comprises:

a plurality of independently formed conductive clips for interconnecting predetermined ones of said holes, each of said clips including a substantially planar wedge-shaped electrically conductive body of a length sufficient to span a portion of said toroidal core and a portion of said first winding, each of said clips having first and second ends extending at predetermined angles to said body, said first and second ends having pins extending therefrom for permitting interconnection to said predetermined patterns of electrical interconnection on said supporting printed circuit board,

said first ends, second ends, and body of pairs of said chips respectively disposed in abutting relationship;

said clips further radially disposed with respect to said central axis.

4,536,734

TRANSFORMER WINDING SHEET INSULATOR WITH SPACER MEMBER

Sadaaki Mabuchi, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 29, 1983, Ser. No. 566,897
Claims priority, application Japan, Jun. 10, 1983, 58-88600[U]
Int. Cl.³ H01F *27/26, 27/30*
U.S. Cl. 336—196 **6 Claims**

1. A transformer comprising:

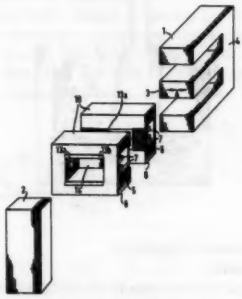
an E-shaped magnetic core having three parallel legs including an inner leg and a transversely extending heel member joining each of said legs at one end thereof;

an I-shaped magnetic core disposed in parallel with said heel member at the opposite end of each leg;

a primary coil wound around said inner leg of said E-shaped magnetic core;

a secondary coil wound around said inner leg and disposed adjacent said primary coil;

sheet insulators, made from insulating material, covering each of said primary and secondary coils so that the coils are each insulated from the magnetic cores; and



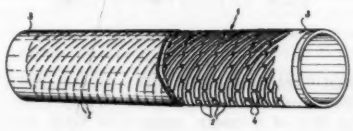
spacer members, each of one-piece construction with each of said sheet insulators and disposed between said coils and said inner leg, for maintaining a desired distance between said coils and said inner leg, each of said spacer members having a portion thereof folded over itself in an accordion-like fashion to provide a bias between the coils and said inner leg.

4,536,735

CURRENT LIMITING HIGH VOLTAGE FUSE ASSEMBLY

Derk van der Scheer, Goor, Netherlands, assignor to Hazemeljer B.V., Hengelo, Netherlands

Filed Feb. 15, 1984, Ser. No. 580,352
Claims priority, application Netherlands, Feb. 16, 1983, 8300581
Int. Cl.³ H01H *85/04*
U.S. Cl. 337—159 **11 Claims**



1. An assembly for use in a current limiting high voltage fuse, said assembly comprising

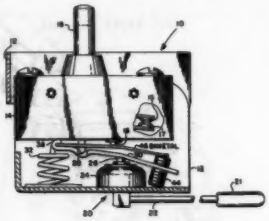
an elongated support body composed of quartz glass, and

a plurality of elongated fusible conductors attached over their entire lengths to said elongated support body so as to be parallel to one another, each said elongated fusible conductor including a plurality of elongated first sections having a first width and a plurality of regularly spaced-apart second sections having a second width, said second width being less than said first width, each of said first and second sections having the same predetermined thickness, said first width being between 0.5 and 1 mm and said predetermined thickness being up to 50 μm, said elongated fusible conductors being spaced apart a distance equal to at least twice their first widths.

4,536,736
THERMOSTAT

Louis F. Aschenbach, Aloha, Oreg., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 8, 1984, Ser. No. 608,320
Int. Cl.[3] H01H 37/36
U.S. Cl. 337—317 8 Claims



1. A thermostat comprising:
(a) base means;
(b) electrical switch means mounted on said base means having a moveable actuator member for effecting snap-action of a set of contacts;
(c) thermally responsive means operable to provide movement of a force member at a predetermined temperature;
(d) lever means pivotally mounted on said base means and operative upon pivotal movement to effect movement of said switch actuator member, said lever means including;
(i) an elongated rigid lever member having said pivotal mount disposed adjacent one end thereof;
(ii) an elongated bimetal spring member having one end thereof attached to said lever in the vicinity of said one end and extending therefrom in cantilever arrangement,
(iii) adjustable means mounted on and carried with said lever member for adjusting the position of the free end of said bimetal member with respect to said lever member, wherein said lever means is disposed such that said force member contacts said elongated member for applying a force thereto effecting pivotal movement thereof and said bimetal member contacts said moveable actuator member for transmitting said force to effect switch snap-action, wherein after switch snap-action said bimetal member is resiliently deflected to absorb over travel of said lever member.

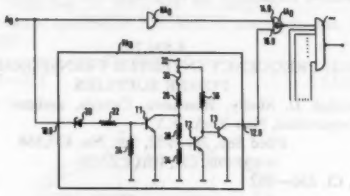
4,536,737
Patent Not Issued For This Number

4,536,738
PROGRAMMABLE CIRCUIT ARRANGEMENT

Horst Huse, Langenpreising, and Werner Elmer, Freising, both of Fed. Rep. of Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 24, 1983, Ser. No. 460,501
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202543; European Pat. Off., Jan. 18, 1983, 83100394.2
Int. Cl.[3] G06F 7/04
U.S. Cl. 340—146.2 5 Claims

1. A circuit which can be programmed by applying a programming voltage so that the circuit delivers a signal at its output having a predetermined binary value, comprising:
input means responsive to the programming voltage, including, threshold switching means connected to an input terminal and having a threshold less than said programming voltage and first switching means having a controlled terminal connected to said threshold switching means, wherein upon application of said programming voltage to said input terminal said threshold switching means switches to a conductive state and renders the first switching means conducting,
a fuse link connected to said first switching means, said fuse link being changable from a conductive state to a non-conductive state when the current flowing therethrough exceeds a predetermined value, upon application of said programming voltage to said input means; and

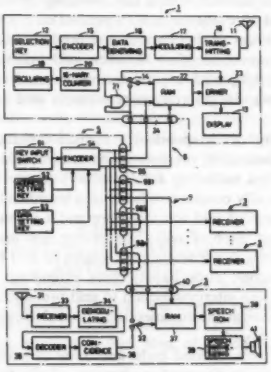


output means connected to said fuse link for delivering a signal having one binary value in the conductive state of said fuse link and the other binary value in the non-conductive state of the fuse link.

4,536,739
APPARATUS FOR COMMUNICATION OF INSTRUCTING INFORMATION

Yoshiji Nobuta, Nara, Japan, assignor to Mizuno Corporation and Sharp Kabushiki Kaisha, both of Osaka, Japan

Filed Jun. 7, 1982, Ser. No. 385,729
Claims priority, application Japan, Jun. 15, 1981, 56-93564
Int. Cl.[3] A63B 71/06
U.S. Cl. 340—323 R 16 Claims



1. An apparatus for communication of instructing information, including a transmitter for transmitting a selected one of a plurality of pieces of instructing information having different meanings, and a receiver for receiving the transmitted selected one of a plurality of pieces of instructing information;
said transmitter including:
first storage means having a plurality of addresses for storing, in respective addresses, a plurality of pieces of instructing data corresponding to said plurality of pieces of instructing information,
display means, including displaying regions respectively capable of displaying said plurality of pieces of instructing information, for reading out the plurality of pieces of instructing data stored in said first storage means and for correspondingly displaying the plurality of pieces of instructing information in respective displaying regions,
selecting means comprising selectors, one for each of said displaying regions in said display means, for selecting any of said plurality of pieces of instructing information being displayed in a corresponding respective displaying region, and

transmitting means responsive to selection of any of the plurality of pieces of instructing information by said selecting means for transmitting a corresponding address signal corresponding to each said piece of instructing information selected by said selecting means; and

said receiver including:

receiving means for receiving each corresponding address signal transmitted by said transmitting means,

second storage means, having corresponding addresses corresponding to said respective addresses of said first storage means, for storage in the corresponding addresses corresponding data corresponding to said plurality of pieces of instructing data stored in said first storage means,

output means responsive to each corresponding address signal received by said receiving means for reading out data from the corresponding addresses of said second storage means based on each corresponding address signal received, and for providing the data thus read out as instructing data corresponding to each said piece of instructing information selected by said selecting means in said transmitter;

said apparatus for communication further comprising:

data changing means for changing any piece of instructing data stored in a respective address in said first storage means and for changing said corresponding data stored in said corresponding address in said second storage means while establishing, in a consistent manner, both a corresponding relation between said piece of instructing information selected by said selecting means and said corresponding address signal transmitted by said transmitting means in said transmitter, and a corresponding relation between said corresponding address signal received by said receiving means and said instructing information corresponding to said instructing data provided by said output means in said receiver.

4,536,740

DOUBLET DETECTOR FOR DATA RECORDING OR TRANSMISSION

Jorgen P. Vinding, Monte Sereno, Calif., assignor to Magnetic Peripherals, Minneapolis, Minn.

Filed Feb. 24, 1984, Ser. No. 583,476

Int. Cl.[3] H03K *17/00*

U.S. Cl. 340—347 DD **4 Claims**

1. In a data recording/transmission system wherein information is encoded in an equalized data signal comprising at least partly doublet pulses, each valid doublet pulse comprising two adjacent opposite polarity pulses, an improved circuit for distinguishing individual doublets from noise in the equalized data signal, said circuit receiving the equalized data signal, and responsive thereto supplying a doublet identification signal identifying individual portions of the equalized data signal as constituting doublets, and comprising:

(a) a differentiator receiving the equalized data signal and providing a signal having a waveform following the time derivative of the equalized data signal, and having a predetermined delay time;

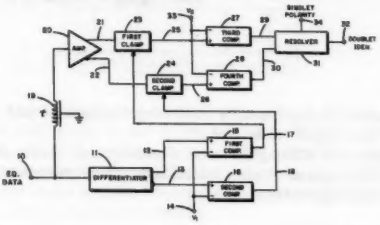
(b) first comparator means receiving the differentiator output for providing as an output a logic level signal having first, second, and third instantaneous states indicating that the differentiator output signal is respectively less than, within, or greater than a first predetermined signal range whose minimum corresponds to an equalized data signal slope smaller than a first predetermined negative slope, and whose maximum corresponds to a slope greater than a second predetermined positive slope;

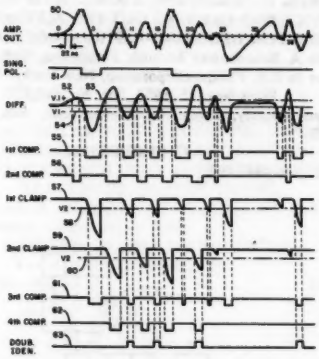
(c) an amplifier receiving a delayed equalized data signal and supplying an amplified output signal having a waveform following the equalized data signal and delayed by a predetermined delay time therefrom;

(d) a delay element receiving the equalized data signal, and supplying the delayed equalized data signal to the amplifier;

(e) analog gate means receiving the amplifier and first comparator means outputs for supplying an output signal including a first portion following the amplifier signal while the first comparator means output signal has exclusively its first state and a second portion following the amplifier signal while the first comparator means output signal has exclusively its third state, each portion having a predetermined level otherwise; and

(f) second comparator means receiving the output of the analog gate means for producing responsive thereto, a logic signal having first, second, and third instantaneous states, said first state and said third state of the second comparator means indicating, respectively, that the first





portion and the second portion of the analog gate means output are outside a second predetermined signal range, and said second state of the second comparator means indicating that both first and second portions of the analog gate means output are within the second predetermined range, said second predetermined signal range substantially corresponding to the minimum excursion of the equalized data signal between points (i) having slopes corresponding to the first and second predetermined slopes and (ii) between peaks of a valid doublet pulse, the output of said second comparator means comprising the doublet identification signal.

4,536,741

DIGITAL QUANTIZER

Robert L. Farah, Brooklyn, N.Y., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 16, 1983, Ser. No. 552,430

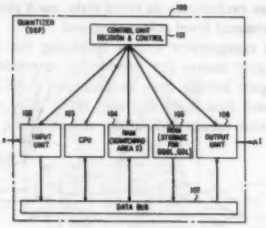
Int. Cl.[3] H03K *13/01*

U.S. Cl. 340—347 DD **23 Claims**

1. Apparatus for converting a digital input signal from a first digital code to a second digital code, characterized by,

means for storing an array of differential quantizer decision levels,

means for combining the digital input signal with said stored differential quantizer decision levels to obtain an array of partial sum signal values, said partial sum signal values having either positive or negative value signs,



means for algebraically combining the signs of said partial sum signal values, and

means for utilizing the result of said algebraic combination of said signs to obtain a second code digital representation of said digital input signal.

4,536,742

METHOD OF ENCODING A STREAM OF DATA BITS, DEVICE FOR CARRING OUT THE METHOD, AND DEVICE FOR DECODING A STREAM OF DATA BITS

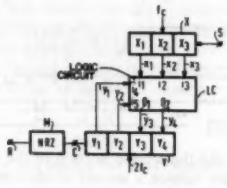
Kornelis A. Schouhamer Immink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,972

Claims priority, application Netherlands, Sep. 15, 1982, 8203575

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD 3 Claims



1. A method of encoding a stream of data bits of a binary source signal into a stream of data bits of a binary channel signal in a transmission system, comprising the steps of dividing the bit stream of the source signal into a contiguous sequence of a limited number of permissible source words of variable length wherein the permissible source words are specified in the following table;

converting said source words into corresponding channel words, each data bit of a source word resulting in two channel bits of the channel word, wherein said channel words are also specified in said table, and

utilizing the following table in said translation:

	Source Word	Channel Word
W_1	000	100100
W_2	00(1)	0000
W_3	0(1)	00
W_4	10	0100
W_5	11	1000.

4,536,743

METHOD OF CONVERTING A DIGITAL SIGNAL INTO AN ANALOG SIGNAL AND A DIGITAL-TO-ANALOG CONVERTER THEREFOR

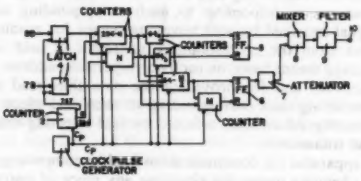
Gohji Uchikoshi, Higashimurayama, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Aug. 9, 1982, Ser. No. 406,214

Claims priority, application Japan, Aug. 14, 1981, 56-127457[U]

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA 3 Claims



1. A method of converting a digital signal into an analog signal, said digital signal consisting of upper and lower bit signals having a predetermined weight ratio, comprising the steps of:

converting said upper and lower bit signals into upper and lower pulse width signals, said upper pulse width signal varying in its pulse width corresponding to a data value of said upper bit signal relative to the center of the pulse width being at a fixed time position within a sampling period, while said lower pulse width signal varies in its pulse width corresponding to a data value of said lower bit signal and the centers of each pulse width being at each pulse edge of said upper pulse width signal;

mixing said upper and lower pulse width signals corresponding to said weight ratio to form a composite signal;

and thereafter passing and composite signal through a smoothing filter to demodulate said digital signal into said analog signal.

4,536,744

ANALOG TO DIGITAL CONVERTER FOR PRECISION MEASUREMENTS OF A.C. SIGNALS

Neil L. Brown, Falmouth, Mass., assignor to Neil Brown Instrument Systems, Inc., Cataumet, Mass.

Continuation of Ser. No. 147,220, May 6, 1980, abandoned. This application Jun. 28, 1983, Ser. No. 508,582

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD 19 Claims

1. An analog-to-digital converter circuit for providing a digital output signal representative of the voltage amplitude of an A.C. input signal, comprising:

a digital-to-analog converter circuit, including:

a multiple widing transformer having one input winding and a plurality of output windings;

means for applying an AC reference signal to the transformer input winding;

a plurality of switching means, responsive to a plurality of first digital signals, for connecting selected ones of the plurality of output windings in series for providing an A.C. transformer output signal having an amplitude which is determined by the plurality of first digital signals applied thereto;

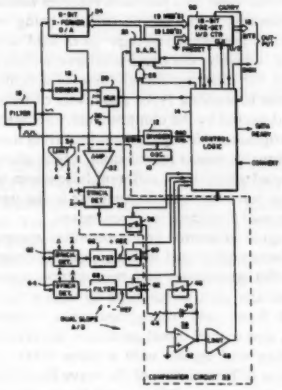
means for connecting the A.C. input signal in series with the A.C. transformer output signal to provide a difference signal representative of the difference therebetween, including means for assuring that the A.C. reference signal is in phase with the AC input signal;

comparator means responsive to the difference signal for providing a comparator output signal representative of

which of the A.C. input signal and the transformer output signal is larger;

means, responsive to the comparator output signal, for providing during a first time interval the plurality of first digital signals to the digital-to-analog converter circuit so as to produce a transformer output signal whose amplitude approximates the amplitude of the input signal;

means for integrating the difference signal during a second time interval which follows the first time interval and for providing a first integrator output signal representative of the integral of the difference signal over the second time interval;



means for integrating a reference signal during over a variable third time interval which follows the second time interval until the magnitude of the integrated reference signal is equal to the first integrator output signal; and

means for determining the duration of the variable third time interval and for providing a plurality of second digital signals representative of the duration of the second time interval;

the first digital signals and the second digital signals respectively representing the most significant bits and the least significant bits of said digital output signal.

4,536,745

SAMPLING FREQUENCY CONVERSION DEVICE

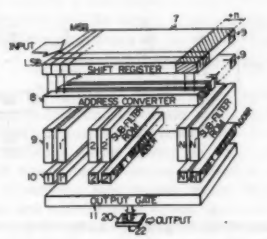
Hirohisa Yamaguchi, Tanashi; Kazuo Yamada, Tokyo, and Tsutomu Miyasato, Tanashi, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,508

Claims priority, application Japan, Jun. 15, 1982, 57-101367

Int. Cl.³ H04L *3/00*

U.S. Cl. 340—347 DD **2 Claims**



1. A sampling frequency conversion device for converting an input digital signal with a sampling frequency (M samples/-second) and each sample having n quantization bits, to an output digital signal with sampling frequency (N samples/-second) and each sample having n quantization bits, where M and N are prime numbers, comprising;

(a) parallel shift registers each having bit length P+n, where P is an odd number equal to or larger than M, for accepting an input signal which has n bits, according to a timing of an input signal;

(b) an address converter for providing P bits of output signal for each of said parallel shift registers for every shift operation of said shift registers;

(c) N groups of ROMs storing

$$\sum_{m=1}^{m} a_i^{(k-m)} h'_m (1 \leqq i \leqq N)$$

at an address designated by the output of said address converter, each group of said ROMs having [n/N]+1 number of ROMs, where K is an integer designating a sampling point, m is an integer designating a filter coefficient, h_m is a coefficient of a filter, a_i is a possible combination of addresses provided by P bits, and [ ] is a Gauss' symbol;

(d) a shift register adder with the bit length 2n for providing an accumulation of the output of said ROMs with shift operation; and

(e) an output gate coupled with an output of said shift register adder for providing a converted output signal;

(f) a buffer memory for storing output of said output gate and providing converted sampled pulses with desired repetition frequency.

4,536,746

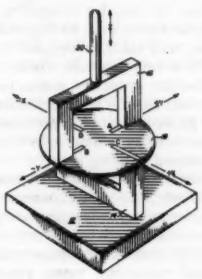
TRANSDUCER FOR CONVERTING THREE DIMENSIONAL MECHANICAL INPUT DISPLACEMENTS INTO A CORRESPONDING ELECTRICAL OUTPUT SIGNAL

Garth W. Gobeli, Albuquerque, N. Mex., assignor to The Mercado Venture, Edgewood, N. Mex.

Filed Sep. 30, 1982, Ser. No. 428,781

Int. Cl.³ G08C *9/00*

U.S. Cl. 340—365 A **21 Claims**



1. Apparatus for converting mechanical input displacements into an electrical output signal representative of said displacements comprising:

a. a flexible web including a first deflection zone extending between first and second spaced apart points on said web and a second deflection zone extending between third and fourth spaced apart points on said web, said first and second deflection zones intersecting to divide each of said zones into first and second sections;

b. a first fixed yoke coupled to the first and second points on said web;

c. a second floating yoke coupled to the third and fourth points on said web;

d. web deflection means coupled to said second yoke for transmitting the mechanical input displacements to said web;

e. sensor means coupled to the first and second deflection zones of said web for generating the electrical output signal representative of the mechanical input displacements, wherein said sensor means includes

i. first means coupled to said first deflection zone for generating an electrical output signal representative of the displacement of the section of said web lying within said first deflection zone; and

ii. second means coupled to said second deflection zone for generating an electrical output signal representative of the displacement of the section of said web lying within said second deflection zone.

4,536,747

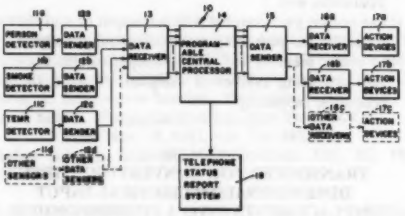
COMPREHENSIVE INTRUDER-ENVIRONMENTAL HAZARD DETECTION, CONTROL, AND ACTION SYSTEM

Garold K. Jensen, 1024 Falcon Dr., River Falls, Wis. 54022

Filed Feb. 11, 1982, Ser. No. 347,952

Int. Cl.³ G08B *23/00, 19/00*

U.S. Cl. 340—502 **12 Claims**



1. A comprehensive security system comprising:

detector means located at a plurality of locations for detecting conditions at said locations, said detector means providing output in response to said detected conditions, said detector means including go, no-go decision processor means for receiving and subjecting said outputs to a go, no-go decision process by comparing said outputs to a predetermined criteria so as to determine whether a valid detection has been made, as opposed to a spurious detection, whereby a very low false alarm rate is assured, said go, no-go decision processor means providing an output upon determination of a valid detection by said detector means, said go, no-go decision processor means requiring multiple detections by said detector means before a detection is determined as being valid;

first signal generator and transmitter means located at said locations and operatively interconnected to said go, no-go decision processor means for generating and transmitting on a RF transmission path signals responsive to the output of said go, no-go decision processor means, said first signal generator and transmitter means providing said signals with a wave form configured to maximize differentiation of the wave form from noise and interference on the RF transmission path, whereby said signals can be readily discriminated from noise and interference;

first data receiver means remote from said first signal generator and transmission means for receiving said signals from a plurality of said first signal generator and transmitter means, said first data receiver means including wave form recognition means for recognizing the wave form of the signals from said first signal generator and transmission means, whereby said first data receiver means is highly selective of the desired wave forms and highly rejective of noise or interference, said first data receiver means including means for outputting a signal, indicative of a specific detected condition, when a signal from said first signal generator and transmitter means is recognized;

reprogrammable central processor means for providing action outputs representative of one or more actions to be taken in response to one or more signals received from said first data receiver means, said reprogrammable central processor means comprising:

i. reprogrammable logic means including manually reprogrammable means for determining one or more actions selected from more than one type of action to be taken by the comprehensive security system in response to a specific detected condition as indicated by the signal received from said first data receiver means, said reprogrammable logic means further being responsive to various preselected groupings of said detected conditions, whereby the comprehensive security system provides for differing forcefulness of actions taken in response to varying types and levels of hazards and danger detected by the comprehensive security system; and

ii. reprogrammable logic means including manually reprogrammable means for selecting a false alarm rate from a selected grouping of different false alarm rates based on the action to be taken in response to the signals received from said first data receiver means;

second signal generator and transmitter means operatively interconnected to said reprogrammable central processor means for generating and transmitting signals on a RF transmission path in response to said action outputs received from said reprogrammable central processor means, said second signal generator and transmitter means providing said signals with a wave form configured to maximize differentiation of the wave form from noise and interference on the RF transmission path, whereby said signals can be readily discriminated from noise and interference; and

a plurality of second data receiver means remote from said second signal generator and transmitter means for receiving said signals from said second signal generator and transmitter means, said second data receiver means including wave form recognition means recognizing the wave form of the signals from said second signal generator and transmitter means, said second data receiver means being operatively interconnected to action devices for activating said action devices in response to said signals received from said second signal generator and transmitter means.

4,536,748

PROCESS FOR PROTECTING A REMOTE MONITORING SYSTEM AGAINST SABOTAGE AND A SYSTEM USING THIS PROCESS

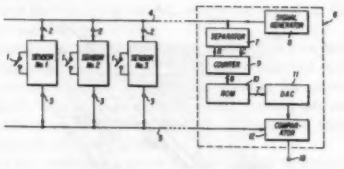
Marc Tonello, Chatou, France, assignor to Compagnie Europeenne de Teletransmission C.E.T.T., Chatou, France

Filed Apr. 28, 1983, Ser. No. 489,355

Claims priority, application France, Apr. 30, 1982, 82 07523

Int. Cl.³ G08B *29/00, 26/00*

U.S. Cl. 340—506 **3 Claims**



1. A remote monitoring system comprising a central station and a plurality of sensors wherein each sensor comprises:

an alarm input terminal;

a synchronizing signal and clock signal separator having one

input connected to the central station and having a first and a second output supplying respectively said synchronizing and said clock signal;

a counter having a reset input and a clock input connected respectively to the first and to the second output of the separator and having outputs;

a read only memory having address inputs connected respectively to the outputs of the counter, and having outputs, for supplying data for synthesizing a waveform;

a digital-analog converter having inputs connected respectively to the outputs of the read only memory and having an ouput, for supplying a variable amplitude signal;

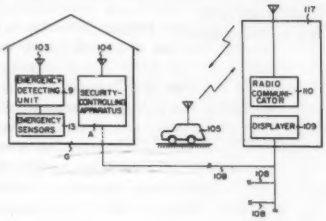
an analog gate having an input connected to the output of the converter, a first control input connected to an output of the memory, a second control input connected to the alarm input terminal and having an output connected to the central station for transmitting the variable amplitude signal to the central station when the sensor is interrogated and when there is no alarm to be transmitted.

4,536,749

SECURITY-ENSURING APPARATUS HAVING AN OPERATIONAL GUIDANCE FUNCTION

Shiro Shirai, Tachikawa; Shunji Ogahara, Musashino, and Miyuki Kubo, Tokyo, all of Japan, assignors to Secom Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,739
Claims priority, application Japan, Jun. 14, 1982, 57-100749
Int. Cl.³ G08B *25/00*
U.S. Cl. 340—525 **11 Claims**



1. A security-ensuring apparatus which is capable of displaying information and which is incorporated in an alarm system having emergency sensors, comprising:

an actuating means for generating an actuation signal for said apparatus upon being operated by the use of a predetermined medium;

a memory means for storing therein display information including at least information on various types of alarm modes, information on operating procedures, and information on the location of said emergency sensors;

a display means coupled to said memory means for displaying said display information supplied from said memory means;

a drive means coupled to said display means and said actuating means for directing the supply of said display information from said memory means to said display means upon the receipt of said actuation signal from said actuating means;

a selector means for selecting a desired alarm mode to be set in said security-ensuring apparatus when said display means displays said display information;

a selection-controlling means having an input coupled to said selector means and an output coupled to said drive means for controlling said display means through said drive means and said memory means, such that said display means displays an alarm mode selected by said selector means;

a first discriminating means operatively coupled to said selection controlling means for discriminating the appropriateness of said selected mode by said selector means; and

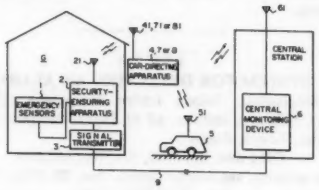
a setting means connected to said memory means, said drive means, and said first discriminating means for registering said selected alarm mode in said memory means upon the receipt of a signal indicating appropriate selection from said first discriminating means.

4,536,750

CAR-DIRECTING APPARATUS FOR AN ALARM SYSTEM

Shigeto Ebihara, Tokyo; Atsuo Ohta, Yokohama, and Kunikazu Kuwabara, Tokyo, all of Japan, assignors to Secom Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1983, Ser. No. 507,235
Claims priority, application Japan, Jun. 30, 1982, 57-111443
Int. Cl.³ G08B *1/08*
U.S. Cl. 340—539 **6 Claims**



1. A car-directing apparatus incorporated into an alarm system which includes emergency sensors for sensing an emergency and/or abnormality occurring in a predetermined protected area, a security-ensuring apparatus arranged in the predetermined protected area and capable of transmitting an emergency-information signal in the form of a modulated coded signal, and a dispatch car in which dispatched engineers are transported to the predetermined protected area when an emergency and/or abnormality occurs, comprising:

a signal-receiving circuit for receiving said emergency-information signal transmitted from said security-ensuring apparatus and a confirmation signal in the form of a radio transmission signal transmitted by said dispatched engineers;

a demodulating circuit connected to said signal-receiving circuit and demodulating said emergency-information signal and said confirmation signal into a coded emergency- information signal and a coded confirmation signal, respectively;

a memory unit arranged so as to store therein predetermined codes, including at least type-of-emergency discriminating codes and a confirmation signal code;

a discriminating unit arranged so as to be connected to said demodulating circuit and said memory unit and discriminating whether said emergency-information signal or said confirmation signal is input thereinto upon the receipt of each signal from said demodulating circuit, said discriminating unit issuing a signal on the basis of the discrimination thereof;

a first emergency-discriminating circuit connected to said discriminating unit so as to respond to said emergency-information signal transmitted from said security-ensuring apparatus;

a second emergency-discriminating circuit connected to said discriminating unit so as to respond to said confirmation signal transmitted by said dispatched engineers;

a car-directing signal-generating unit for generating a signal to direct said dispatched engineers in said dispatch car to said predetermined protected area when said first emergency-discriminating circuit responds to said emergency-information signal;

an AND gate circuit having input terminals connected to

said first and second emergency-discriminating circuits, said AND gate circuit issuing an output signal upon the receipt of signals from both said first and second emergency-discriminating circuits;

a priority circuit arranged so as to be connected to said AND gate circuit for generating a prior emergency signal upon the receipt of said output signal from said AND gate circuit;

a display unit connected to said first emergency-discriminating circuit for displaying an emergency-information signal in response to a signal from said first emergency-discriminating circuit;

a signal-modulating circuit for modulating said prior emergency signal from said priority circuit;

a signal-emitting circuit for emitting said modulated prior emergency signal from said signal-modulating circuit; and

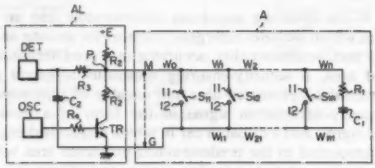
a built-in electric power unit for electrically powering said aforementioned circuits and units of said car-directing apparatus, said electric power unit comprising a battery means.

4,536,751

SYSTEM FOR DETECTING AN ALARM

Mineo Shigemitsu, Tokyo; Ichiyo Maruyama, Chofu, and Shigeru Niimura, Mitaka, all of Japan, assignors to Secom Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1983, Ser. No. 507,096
Claims priority, application Japan, Jun. 30, 1982, 57-111441
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—545 **3 Claims**



1. A system for detecting an alarm for emergency situations in a predetermined guard area of a building or house, comprising:

an alarm circuit including at least one or more alarm switch units for detecting the emergencies and a resistor and a capacitor connected between first contacts and second contacts of said alarm switch units; and

an alarm device including a detecting circuit for detecting voltage changes of a predetermined measuring point, a pulse oscillator for generating a pulsating voltage, and a transistor for repeatedly turning on and off the current in response to the pulsating voltage applied from said pulse oscillator;

wherein no current flows in said alarm circuit after said capacitor is charged up, and a small amount of discharge current flows when said pulsating voltage is applied to the base of said transistor, then, such states are repeated under an ordinary condition of said predetermined guard area, current flows in said alarm circuit under emergencies, and the voltage change is detected at said measuring point of said alarm device.

4,536,752

INTRUSION DETECTION SYSTEM AND METHOD

James Cheal, and James R. Fitzsimons, both of Tempe, Ariz., assignors to Southwest Microwave, Tempe, Ariz.

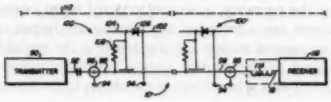
Filed Dec. 29, 1982, Ser. No. 454,444
Int. Cl.³ G08B *13/18*
U.S. Cl. 340—554 **18 Claims**

1. A method for detecting intrusions into a protected region, said method comprising the steps of:

(a) transmitting a microwave signal along a cable bounding said protected region;

(b) coupling relatively small portions of said microwave signal into each of a plurality antennas to effect radiating microwave energy from said antennas into said protected regions;

(c) periodically causing interrupting of microwave energy that is received by radiating elements of each of said respective antennas at a frequency that is greatly lower than the frequency of said microwave signal in order to produce a first signal which is a chopped microwave signal on said cable, said cable also conducting a noise



signal that is within the doppler frequency range of a moving target in said protected area;

(d) filtering microwave frequencies from said first signal and mixing said filtered first signal with said noise signal to produce a second signal, said second signal including a sequence of pulses that represent said first signal and are superimposed on said noise signal;

(e) producing a signal representative of the amplitudes of said pulses of said sequence by comparing the potentials of said second signal before and during a plurality of said pulses, respectively; and

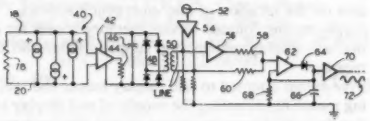
(f) producing an alarm signal.

4,536,753

SELF MONITORING INTRUDER DETECTING SYSTEM OF NOISE-CANCELLING VIBRATION DETECTORS

William H. Parker, Hurst, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Filed Aug. 2, 1982, Ser. No. 404,406
Int. Cl.³ G08B *13/10*
U.S. Cl. 340—566 **8 Claims**



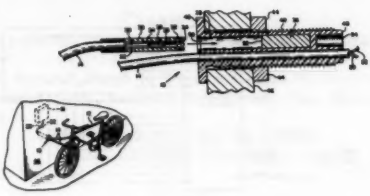
1. A self monitoring noise-cancelling intruder detection system comprising an array of vibration detectors interconnected by a two-wire line into a configuration for cancelling wide area noise, means for processing signals originating in said array, transformer means coupled between said array and said signal processing means, means for completing a low level current leakage path across said line to enable said means for processing signals to detect a presence, absence, or significant change in said low level current, and means responsive to signals transmitted from the array through said transformer means to said processor means for signaling alarm conditions in said array.

4,536,754

MAGNETICALLY RETAINED CONNECTING CABLE INCORPORATING MAGNETICALLY OPERATED SWITCH

Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.

Filed May 13, 1983, Ser. No. 494,345
Int. Cl.[3] G08B *13/14*
U.S. Cl. 340—568 19 Claims



1. A device for incorporation in a physical security alarm system for detecting removal of an object from a predetermined location, comprising:

(a) electrical switch means responsive to a magnetic field for changing state between a first state and a second state in response to the presence of a predetermined magnetic field strength;

(b) a quantity of ferromagnetic material associated with said switch means and fixedly located with respect to said switch means, at a predetermined distance therefrom;

(c) an actuating magnet selectively located with respect to an object present in said predetermined location, whose removal it is desired to detect, said actuating magnet having sufficient field strength to hold said quantity of ferromagnetic material and said switch means in a predetermined position relative to said actuating magnet and to provide said predetermined magnetic field strength to said switch means when said ferromagnetic material and said switch means are in said predetermined position;

(d) electrical conductor means electrically connected with said switch means for connecting said switch means electrically to an alarm system circuit to make possible electrical detection of the state of said switch means; and

(e) connecting means interconnecting said switch means with said predetermined location, for separating said switch means and said quantity of ferromagnetic material from said predetermined position upon removal of said object from said predetermined location.

4,536,755

APPARATUS FOR DETECTING UNAUTHORIZED EGRESS BY PATIENT FROM POSITION OF CONFINEMENT

Curtis R. Holzgang, Beaverton; Mark K. Leavitt, Portland; Alfred D. Doney, Oregon City, and James Kuehn, Gladstone, all of Oreg., assignors to Rigi Systems, Inc., Beaverton, Oreg.

Filed Mar. 7, 1983, Ser. No. 473,000
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—573 5 Claims

1. An apparatus for monitoring the activity of a patient, comprising:

switch means actuable in response to an amount of gravitational force corresponding to a preselected amount of downwardly directed inclination of the switch means;

means to position the switch means on the patient's leg so that the switch means is actuated whenever the downwardly directed inclination of the femur portion of the leg proximal the knee exceeds the preselected amount;

alarm means responsive to the actuation of the switch means to indicate that the patient is in an ambulatory enabling position; and

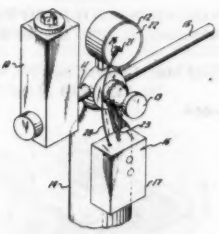
means to detect an unauthorized removal of the switch means from the patient's leg.

4,536,756

PRESSURE INDICATOR AND ALARM

Michael DePasquale, 779 Tiffany Ave., River Vale, N.J. 07675, and William S. Adam, 43 W. Fairmount Ave., Maywood, N.J. 07607

Filed Dec. 5, 1983, Ser. No. 558,048
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—626 7 Claims



1. A pressure indicator and alarm system used in conjunction with gas cylinders which will sound a warning and flash a light when the gas supply is running low and the cylinder is in need of replacement and wherein the gas cylinder further comprises a regulator, valve, and pressure gauge wherein the pressure indicator and alarm device comprises;

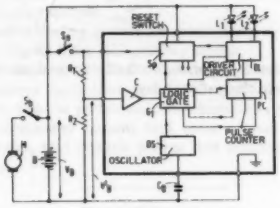
a housing to be attached to a metal portion of the regulator-valve system wherein the housing contains a battery, a piezo alert audible warning device, a light source, electrical lead lines connecting the said battery to said piezo alert audible warning device and said light source, an electrical lead line connecting to a means for attaching said housing to said regulator-valve system and, an electrical lead line for connecting said battery to a pin inserted through a lens of said guage into the path of a rotating indicator arm wherein when the rotating indicator arm associated with said gauge makes

contact with said pin inserted through said lens an electrical circuit will be completed and the piezo alert audible warning device will sound and the light source will be illuminated.

4,536,757
DEVICE FOR SIGNALLING A SPECIFIC CHARGE CONDITION OF AN ACCUMULATOR BATTERY

Johannes Ijntema, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 23, 1983, Ser. No. 554,744
Claims priority, application Netherlands, Nov. 30, 1982, 8204628
Int. Cl.³ G08B 21/00
U.S. Cl. 340—636 15 Claims

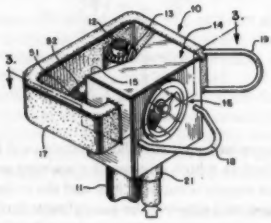


1. A device for signalling a specific charge condition of an accumulator battery incorporated in a battery-powered apparatus, which device comprises a comparator circuit for comparing the battery voltage with a reference voltage, a switching circuit controlled by the comparator circuit into a first state when the battery voltage drops below a given voltage level, an indicator controlled by the switching circuit, and a memory circuit coupled to the switching circuit, said memory circuit including time delay means for maintaining the indicator energized for a specific time interval after the apparatus has been switched off provided the switching circuit is in the first state when the apparatus is switched off.

4,536,758
FAULT INDICATOR WITH PUSH BUTTON RESET

Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60118

Filed Mar. 10, 1983, Ser. No. 474,132
Int. Cl.³ G08B 21/00
U.S. Cl. 340—664 23 Claims



1. A fault indicator for indicating the occurrence of a fault current in an electrical conductor, comprising:

a housing;

indicator means in said housing having fault and reset indicating states in response to an applied magnetic field for indicating the occurrence of fault and reset conditions in the conductor;

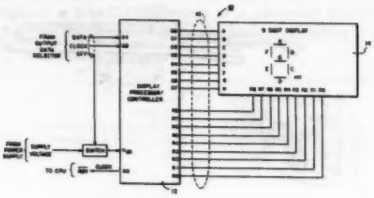
flux concentrating means in magnetic communication with said conductor for applying a first magnetic field to said indicator means to condition said indicator means to a fault state upon the occurrence of a fault current in the conductor; and

user-actuable reset means including a permanent reset magnet mounted for reciprocation within said housing for applying a second magnetic field to said indicator means upon reciprocation of said permanent magnet to condition said indicator means to a reset state.

4,536,759
MULTI-FORMAT DATA DISPLAY

Donald V. DiMassimo; John B. May, both of Liverpool, and Michael D. Lemmon, Syracuse, all of N.Y., assignors to General Electric Company, Somersworth, N.H.

Continuation of Ser. No. 238,477, Feb. 26, 1981, abandoned.
This application Jul. 14, 1983, Ser. No. 513,262
Int. Cl.³ G09G 3/14
U.S. Cl. 340—706 14 Claims



1. A multi-format display apparatus for receiving data words from a data source and displaying data contained in the data words in a plurality of different formats, said multi-format display apparatus comprising:

a. display means for displaying data;

b. a display processor under programmed control interconnected between said data source and said display means for formatting the data contained within the data words and transferring the formatted data to said display means for display thereon, the data words provided by said data source having a predetermined format and being in the form of a series of asynchronous digital data bits, each data word including a sync code portion comprising a predetermined pattern of serial data bits and a message portion comprised of at least a decodable format code segment and a data segment, said display processor comprising,

(i) means for receiving the asynchronous digital data bits from said data source, including means for recognizing the predetermined sync code pattern in the sync code portion of each data word received and indicating when each received data word has been stored in said display processor,

(ii) first register means for sequentially storing the message portion of each data word received by said means for receiving after recognition of the predetermined sync code pattern of each received data word by said means for recognizing,

(iii) means for decoding the contents of the format code segment of the message portion of each data word after storage in said first register means as indicated to said means for decoding by said means for recognizing, and for selectively directing subsequent operations of said display processor by indicating which of several operations is to be performed as indicated by the resultant decoding of the format code segment of each data word stored in said first register means,

(iv) second register means for storing preselected constants contained in the data segment of the message portion of a first data word stored in said first register means as directed by said means for decoding of the format code segment of said first data word,

(v) third register means for storing data to be displayed,

(vi) means for selectively formatting data contained in the data segment of the message portion of a second data word stored in said first register means, including means for selectively modifying specified ones of the preselected constants stored in said second register means and selectively storing the formatted data and selected ones of the preselected constants in said third register means as directed by said means for decoding of the format code segment of said second data word and,

subsequent to the storage of the formatted data and the preselected constants in said third register means, indicating that the contents of said third register means are to be transferred to said display means, and

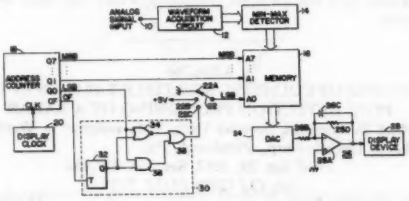
(vii) means for selectively transferring the formatted data and certain ones of the preselected constants from said third register means to said display means for display thereon when indicated by said means for selectively formatting.

4,536,760

SIGNAL-ENVELOPE DISPLAY SYSTEM FOR A DIGITAL OSCILLOSCOPE

Luis J. Navarro; Joseph R. Peter, and Bruce W. Blair, all of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 15, 1982, Ser. No. 434,459
Int. Cl.³ G09G *1/00, 3/00*
U.S. Cl. 340—722 **5 Claims**



1. A display system for a digital oscilloscope in which for each spaced interval along a signal waveform a maximum and a minimum amplitude value are obtained to provide a sequence of max-min value pairs, comprising:

memory means for storing ordered pairs of said maximum and minimum amplitude values such that said max-min pairs are stored in adjacent addressable storage locations;

address counter means for providing a binary address count signal consisting of binary bits to address said memory means sequentially to retrieve said maximum and minimum values;

control circuit means for selectively inverting the least significant bit of the address count signal thereby transposing the order of maximum and minimum values in each max-min value pair being retrieved from said memory means;

means responsive to the retrieved sequence of max-min value pairs for generating a display signal therefrom.

4,536,761

RADIO PAGING RECEIVER HAVING DISPLAY CONTROL MEANS

Kazuyuki Tsunoda, and Yoshio Ichikawa, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 466,383
Claims priority, application Japan, Feb. 12, 1982, 57-19764
Int. Cl.³ H04B *5/04;* **H04Q** *9/00*
U.S. Cl. 340—825.44 **6 Claims**

1. A radio paging receiver having a display means and a switch which can be selectively activated and released, said receiver comprising:

a first means for detecting a selective calling signal assigned to said receiver;

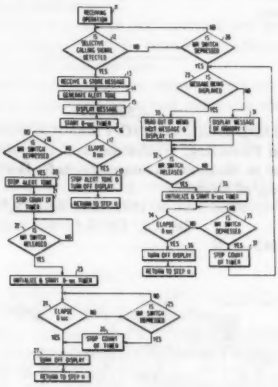
a second means for receiving and storing a message transmitted subsequently to said selective calling signal;

a third means for generating an alert tone in response to the detection of said selective calling signal;

a fourth means for displaying the message stored in said second means on said display means in response to the reception of said message;

a fifth means for stopping the generation of said alert tone and the display of said message after a first predetermined period of time has elapsed;

a sixth means for stopping the generation of said alert tone when said switch is activated within said first predetermined period of time;



a seventh means for stopping the display of said message after a second predetermined period of time that starts from the release of the activated switch; and

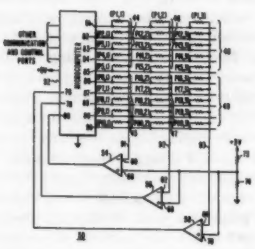
an eighth means for stopping the display of said message when said switch is activated within said second predetermined period of time.

4,536,762

MATRIX ENCODER FOR SENSOR ARRAYS

Roger D. Moates, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 17, 1982, Ser. No. 378,536
Int. Cl.³ G08C *19/00, 19/36, 19/04*
U.S. Cl. 340—870.02 **8 Claims**



1. Encoder apparatus comprising:

means for selectively supplying a sensed condition in response to an input condition,

a set of resistive sensors coupled to said supply means and operable between a first resistive state in the absence of said sensed condition and a second resistive state in the presence of said sensed condition,

means for sequentially selecting a subset of said sensor set and for generating a test signal responsive to said sensed condition,

reference means for deriving a first reference signal from the non-selected sensors of said set,

means for providing a second reference signal, said second reference signal having a preselected known magnitude,

comparator means connected to said selected subset and to

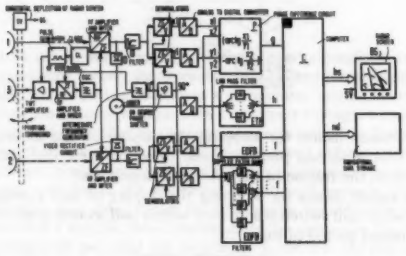
the non-selected sensors of said set for processing said test signal and also connected to said second reference signal and for generating an output signal representative of the resistive state of said selected sensors from the relative values of said test signal and said first reference signal, said comparator means being connected to said reference means.

4,536,763

ON-BOARD ORIENTATION DEVICE FOR AIRCRAFT

Klaus von Pieverling, Wolfratshausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,705
Int. Cl.³ G01S 13/60
U.S. Cl. 343—9 R **2 Claims**



1. A device for on-board orientation in vehicles, such as aircraft which move relative to the ground, comprising a beam antenna which is sharply angularly focused in azimuth and less sharply focused in elevation and which scans the terrain in azimuth by swinging the radiating energy from said antenna, a receiver receiving from said antenna at each azimuth angle from the terrain at the angular range illuminated by the vertical antenna pattern a mixture of echo signals having different transit times which are respectively, proportional to the range of the respectively reflecting terrain elements and have different Doppler frequencies f_d according to the relationship $f_d = f_{dmaxa} \cdot \cos = (2v_{Ha}/\lambda) \cdot \cos\ \epsilon$, wherein v_{Ha} is the aircraft velocity in the direction of the azimuth angle, λ is the radar wavelength and ϵ is the aspect angle of the appertaining terrain element, an image display device connected to said receiver for displaying a vertical image display of each azimuth angle which is illuminated by a plurality of radar wave trains, and the echo signals respectively received during successive time windows range gates and, thus, from successive distance range gate ranges and which are analyzed as to their Doppler frequencies, and said display device having a light spot for display on its picture screen which is vertically deflected proportional to the respective aspect angle, so that, in response to an echo received at a specific aspect angle and with a specific amplitude, the image spot is reproduced from such echo with a corresponding brightness and deflection which is proportional to the aspect angle, characterized in that the antenna is formed of at least two reception antenna rods (1 and 2) to form a direction-finding antenna and said antenna rods (1, 2) are mounted parallel to each other with a spacing of a few wavelengths, and the path difference (G) between echo signals received at the two reception antenna rods (1, 2) from the same terrain element (R) is determined by phase angle subtraction of the phase angles individually related to the range gate and is stored in a storing means, and the Doppler frequency is determined for each range gate, and the reference frequency

$$f_{dmaxa} = \frac{\sqrt{f_{di}^2 + f_{dj}^2 - 2 \cdot f_{di} \cdot f_{dj} \cdot \cos((G_i - G_j)/s}}{\sin((G_i - G_j)/s}$$

is determined from the path differences and Doppler frequencies of at least two range gate ranges, wherein f_{di} and f_{dj} are the Doppler frequencies determined in the range gate ranges, G_i and G_j are the path differences determined in the appertaining range gate ranges, and s is the path difference steepness dependent on the respective aspect angle ϵ^*, and for terrain representation on the radar screen, the light spot in at least one range (II) of mean aspect angles is vertically deflected approximately proportional to the magnitude

$$\epsilon_{II} = \text{arc cos} \frac{f_d \cdot \sin((G_i - G_j)/s)}{\sqrt{f_{di}^2 + f_{dj}^2 - 2 \cdot f_{di} \cdot f_{dj} \cdot \cos((G_i - G_j)/s)}}$$

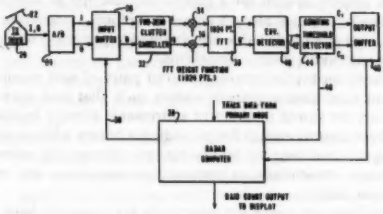
wherein f_d is the Doppler frequency which has been determined.

4,536,764

METHOD OF COUNTING MULTIPLE TARGETS IN THE POST DETECTION PROCESSING OF A RADAR

Robert D. Freeman, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 427,332
Int. Cl.³ G01S 13/52, 7/28
U.S. Cl. 343—5 SA **12 Claims**



1. In the post detection processing of a radar, a method of counting multiple targets moving in close proximity to one another comprising the steps of:

(a) selecting a set of contiguous doppler frequency signals from a plurality of doppler frequency signals computed from the received echo signal information in a range gate of a radar look;

(b) identifying a first doppler frequency from said selected set in accordance with the amplitude of the signal associated therewith;

(c) selecting a first contiguous subset of doppler frequencies of said set positioned about said first doppler frequency;

(d) deriving a first threshold level based on the amplitude of said first doppler frequency signal;

(e) counting the doppler frequency signal amplitudes in said first contiguous subset which exceed said first threshold signal to establish a first count;

(f) thereafter, identifying a second doppler frequency from said selected set in accordance with the amplitude of the signal associated therewith;

(g) selecting a second contiguous subset of doppler frequencies of said set positioned about said second doppler frequency;

(h) deriving a second threshold level based on the amplitude of said second doppler frequency signal and said established first count;

(i) counting the doppler frequency signal amplitudes in said

second contiguous subset which exceed said second threshold level to establish a second count; and

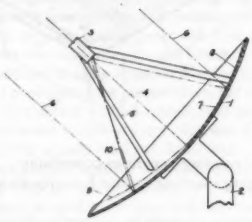
(j) deriving a final count from said first and second counts in accordance with a predetermined count algorithm, whereby said final count is representative of the multi-target count for the range gate being processed.

4,536,765

METHOD FOR REDUCING ICE AND SNOW BUILD-UP ON THE REFLECTING SURFACES OF DISH ANTENNAS

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Filed Aug. 16, 1982, Ser. No. 408,158
Int. Cl.³ H01Q *1/02*
U.S. Cl. 343—704 **10 Claims**



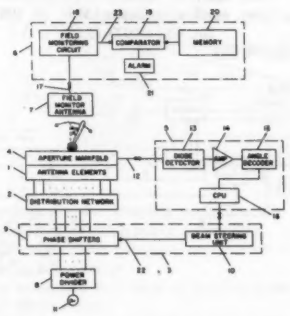
1. A method for preventing the build-up of ice and snow on the inclined reflecting surface of a dish antenna, which receives signals from a satellite, comprising coating the reflecting face of the antenna with a thin layer of weather-resistant material having a low coefficient of friction with respect to ice or snow of less than about 0.4 to produce a non-wettable outer surface operable to shed ice and snow, said coating having a textured pattern including minute hills and valleys to reduce solar radiation reflectivity to about 10% or less, yet avoid capillary retention of ice and snow.

4,536,766

SCANNING ANTENNA WITH AUTOMATIC BEAM STABILIZATION

Richard F. Frazita, St. James, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,057
Int. Cl.³ H01Q *3/22, 3/24, 3/26*
U.S. Cl. 343—372 **2 Claims**



1. In an antenna system for radiating wave energy signals into a selected region of space and in a desired radiation pattern comprising:

(a) an aperture comprising an array of antenna elements;

(b) first means for coupling supplied wave energy signals to the antenna elements; and

(c) second means for scanning a beam radiated by the array in accordance with a predetermined pattern, said beam resulting from the supplied wave energy signals coupled to the antenna elements;

the improvement comprising:

a manifold directly coupled to said aperture and providing an output representative of the beaming pointing angle of a beam radiated by said aperture;

detecting means for detecting the output of the manifold;

decoding means associated with said detecting means for providing an output corresponding to the beam pointing angle represented by the detected output of the manifold; and

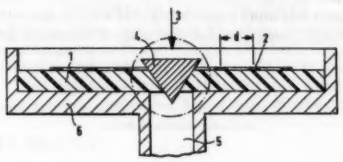
controlling means for adjusting the start/stop time of the scanning of said beam whereby the predetermined pattern is not modified.

4,536,767

MICROWAVE DIRECTIONAL ANTENNA EMPLOYING SURFACE WAVE MODE

Bernhard Rembold, Neu-Ulm, and Klaus Solbach, Ulm, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,354
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210895; Aug. 5, 1982, 3217437
Int. Cl.³ H01Q *13/28*
U.S. Cl. 343—785 **9 Claims**



1. A microwave directional antenna, comprising:

a flat circular metallic ground plate (6) having a flat surface with a central circular opening therein, said ground plate having a circular outer wall extending axially outwardly from said flat surface,

a flat circular disc (1) of dielectric material lying over and in contact with said flat surface of said ground plate, said disc covering said central opening and having an outer flat surface facing away from said flat surface of said ground plate, said disc covering said opening and extending to said wall of said ground plate;

a hollow circular waveguide (5) made of metal and connected to said ground plate, said hollow waveguide having a central passage communicating with said opening of said ground plate for supplying microwave radiation to said disc;

a metal transition member (4) connected to said disc at a center of said disc and overlying said opening of said ground plate for changing a mode of propagation of microwave radiation from said waveguide to said disc; and

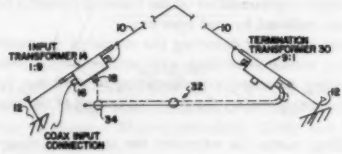
a plurality of line discontinuities (2) at least at said outer flat surface of said disc, said discontinuities lying in a plurality of concentric radially spaced rings in said outer flat surface of said disc, said rings being radially spaced by an equal selected spacing (d) to effect a radiation characteristic for microwave radiation propagating radially through said disc whereby microwave radiation propagating radially through said disc is deflected to radiate axially from said disc upon approaching said discontinuities.

4,536,768

COAXIAL POWER DISSIPATION LINE

Palemon W. Dubowicz, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 29, 1983, Ser. No. 489,993
Int. Cl.³ H01Q 11/06
U.S. Cl. 343—736 6 Claims



1. Power dissipation termination apparatus for an inverted-V antenna of the type utilizing an impedance matching input transformer at one end of the antenna for signal radiation in ground-to-ground communication systems, comprising:

a coaxial cable having an inner conductor and a surrounding shield;

a termination transformer at the other end of the antenna coupled to match the characteristic impedance of said coaxial cable with the characteristic impedance of said antenna, said termination transformer having the input thereof coupled to said antenna and the output thereof coupled to said inner conductor of said coaxial cable at one end of said cable;

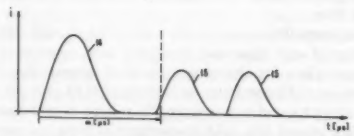
and wherein said cable is physically extended beneath said antenna in a direction from said termination transformer towards said input transformer, and with its said surrounding shield being coupled to a point of electrical ground.

4,536,769

METHOD OF RECORDING INFORMATION ON AN ELECTROSENSITIVE RECORD CARRIER

Dietrich J. Bahr; Karl-Heinz Burckardt, both of Herrenberg; Gottfried Goldrian, Boblingen; Volker Rudolph, Aidlingen, and Wilhelm G. Spruth, Boblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,558
Claims priority, application European Pat. Off., Mar. 25, 1982, 82102517
Int. Cl.³ G01D 15/08
U.S. Cl. 346—1.1 5 Claims



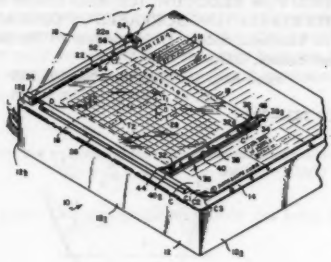
4. A method of using a print electrode for recording on an electrosensitive record carrier by supplying printing current pulses to the print electrode including the step of selecting the duration and amplitude of each print current pulse so that the print process of the print electrode initiated by the print pulse is completed by the time the print pulse terminates.

4,536,770

REVERSE SIDE MARKING PLOTTER/PRINTER PAD

Richard M. Allen, Andover, Mass.; Jeffrey M. Arnold, Ridgewood, N.J.; Joseph J. Field, Hudson, N.H., and Terry E. Spraker, Middleton, Wis., assignors to Allen Datagraph Incorporated and Datascope Corporation

Filed Oct. 3, 1983, Ser. No. 538,321
Int. Cl.³ G01D 9/00, 15/34
U.S. Cl. 346—29 17 Claims



1. Plotting and printing apparatus comprising

A. means defining a writing surface for supporting a printing medium,

B. means defining an opening in said surface for exposing the underside of said medium,

C. a transparent plate dimensioned to cover said opening, but to leave uncovered at least a portion of said surface,

D. means for mounting said plate to said surface defining means so as to permit the placement on said surface of a printing medium whose area is larger than that of the plate so that a first portion of the medium extends across the opening underneath the plate and a second portion of the medium extends beyond the plate and is supported by said supporting surface portion so tnat it can be written on from above said surface, and

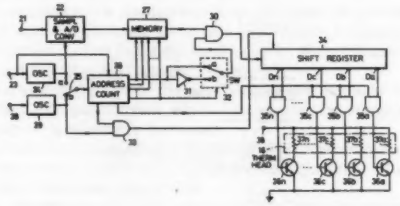
E. printing means including a print head mounted to said surface defining means so that the print head is disposed opposite said opening and can print on the underside of the first medium portion exposed in said opening.

4,536,771

HEATING CONTROL DEVICE FOR A THERMAL INK-TRANSFER TYPE PRINTING APPARATUS

Hideshi Tanaka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 10, 1983, Ser. No. 474,194
Claims priority, application Japan, Mar. 16, 1982, 57-41192
Int. Cl.³ G01D 15/10
U.S. Cl. 346—76 PH 7 Claims



1. A heating control device in a thermal ink-transfer type printing apparatus comprising a thermal printing head having n head elements with respect to one printing line, where n is an integer, each of said n head elements comprising a heating

resistor for heating a transfer sheet having a kind of ink which melts due to heat and for transferring melted ink onto a recording sheet which makes contact with said transfer sheet to print images such as characters and figures, the heating resistors being physically isolated from each other, said heating control device comprising:

converting means for sampling an input analog signal indicating tone of printing of an image to be printed on said recording sheet in accordance with the number n of said head elements and for converting said input analog signal into a digital signal;

memory means for storing the output digital signal of said converting means and for reading out the stored digital signal from n addresses corresponding to each of said n head elements; and

control means for obtaining during a first time period first signals read out from first n/2 addresses which are not adjacent to each other from among the signals read out from said n addresses in said memory means, for simultaneously driving during a second time period n/2 head elements corresponding to said first n/2 addresses so as to heat selected heating resistors from an initial temperature up to a predetermined temperature, for obtaining during a third time period second signals read out from remaining n/2 addresses which are not adjacent to each other from among the signals read out from said n addresses in said memory means, and for simultaneously driving during a fourth time period remaining n/2 head elements corresponding to said remaining n/2 addresses so as to heat selected heating resistors from the initial temperature up to the predetermined temperature,

said first through fourth time periods being consecutive time periods,

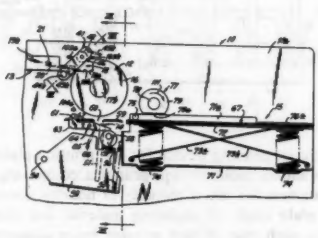
said second and fourth time periods being sufficiently long time periods so that heated heating resistors cool down approximately to the initial temperature from the predetermined temperature within said second and fourth time periods.

4,536,772

THERMAL TRANSFER PRINTING APPARATUS

Mitsuhiro Isogai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1983, Ser. No. 468,944
Claims priority, application Japan, Feb. 24, 1982, 57-27516
Int. Cl.³ B41J *3/70*
U.S. Cl. 346—76 PH **17 Claims**



1. A thermal transfer printing apparatus for printing an image on a sheet of printing paper comprising:

a rotatable platen roller having a surface for backing-up said sheet of printing paper;

means for wrapping said sheet of printing paper about said surface of the roller;

a thermal head having a plurality of selectively energizable heating elements confronting said surface of the platen roller and arranged substantially along a straight line parallel with the axis of rotation of said roller;

ink carrying means for positioning thermally transferable dye material between said heating elements and said printing paper backed-up by said surface of the roller;

means for pressing said thermal head toward said roller with said ink carrying means and the sheet of printing paper therebetween for the selective transfer of said dye material to said printing paper in dependence on the selective energization of said heating elements;

first shifting means for rotating said roller and thereby moving said thermal head and said printing paper relative to each other in a direction extending transversely in respect to said straight line;

means for operating said ink carrying means, said means for pressing and said thermal head synchronously with said first shifting means so as to print said image on said sheet of printing paper wrapped about said surface of the roller in the course of a plurality of complete revolutions of the roller;

second shifting means for moving said thermal head and said sheet of printing paper relative to each other in a direction along said straight line; and

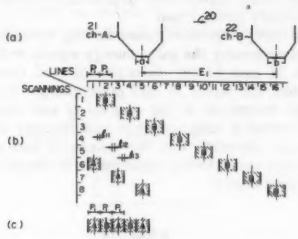
means for actuating said second shifting means to relatively move said thermal head and said sheet of printing paper in an interval between said complete revolutions of the roller required for the printing of said image on said sheet of printing paper.

4,536,773

MAGNETIC RECORDING APPARATUS WITH ADJUSTABLE LINE DENSITY

Norio Kokaji, Hino, and Kunio Kinoshita, Hachioji, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 370,128, Apr. 20, 1982, abandoned.
This application Aug. 6, 1984, Ser. No. 637,346
Claims priority, application Japan, Apr. 21, 1981, 56-60317
Int. Cl.³ G01D *15/12*
U.S. Cl. 346—74.2 **8 Claims**



1. Apparatus for forming latent images in a magnetic printing apparatus comprising:

a. A recording head having therein a plurality of channels of different widths as measured in the main scanning direction, wherein the tracking locus of each of said different width channels corresponds to a different number of lines in the sub-scanning direction;

b. Recording head control means for selecting and driving at least two channels of different widths such that the line-recorded altent images of a wider track are reduced in width by a subsequently recorded latent images of a succeeding narrower channel which overlaps an edge portion of said wider channel, thereby to provide data tracks in the sub-scanning direction which are of substantially equal width as measured in the main scanning direction, and without unrecorded line space therebetween.

4,536,774

THERMAL HEAD DRIVE CIRCUIT

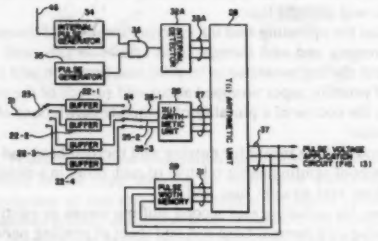
Toshiharu Inui, and Haruhiko Moriguchi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1984, Ser. No. 591,859

Claims priority, application Japan, Apr. 1, 1983, 58-55266; Apr. 30, 1983, 58-74900

Int. Cl.³ G01D 15/10

U.S. Cl. 346—76 PH 20 Claims



11. A thermal head drive circuit with an input connected to a source of printing data, and an output connected to a thermal head including individually actuatable and heatable heater elements, for printing successive lines comprising:

a. a pulse-applying circuit having an input and an output, the output of said pulse-applying circuit being connected to the input of said thermal head, and the input of said pulse-applying circuit receiving pulse energy signals for applying printing pulse energy data to said thermal head;

b. storage means having an input and an output, the printing data from said printing data source being successively read line by line into the input of said storage means;

c. an arithmetic heat accumulation state operator having an input and an output, the input of said operator being connected to the output of said storage means;

d. a temperature detector having an input and an output for detecting an internal temperature in said thermal head;

e. a memory having an input and an output for storing the pulse energy signals used in printing the line immediately previously printed; and

f. pulse energy operator means having inputs and an output for determining the pulse energy signals to be applied to each of said heater elements for said line next to be printed, the inputs of said pulse energy operator means being connected to the outputs of said arithmetic heat accumulation state operator, said memory and said temperature detector, and the output of said pulse energy operator means being connected to the input of said pulse-applying circuit.

4,536,775

THERMAL PRINTING APPARATUS

Trevor A. Calnek, Waterloo, and John E. Bray, Guelph, both of Canada, assignors to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Dec. 14, 1983, Ser. No. 561,489

Int. Cl.³ H05B 5/08

U.S. Cl. 346—76 PH 3 Claims

1. Printing apparatus comprising

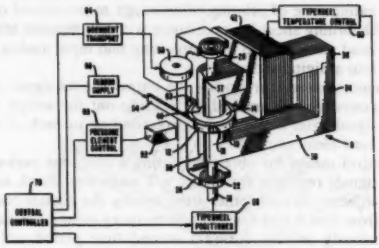
support means;

a magnetic core having a gap therein and having a slot in said core which extends through the gap, and mounted on said support means;

a coil mounted on said core and capable of generating a magnetic field in said core which extends through said gap;

a rotatable cylindrical thermal print head including an annular element of high conductivity material having a plurality of print characters arranged on the periphery thereof and fixed to a central hub of nonconductive material, said print head being located at least partially within the gap of said magnetic core;

shaft means disposed within the slot in said magnetic core for rotatably mounting said print head on said support means in operative relation to the gap of said magnetic core;



motor means mounted on said support means and operatively coupled to said shaft means for moving said print head to position a selected character for printing; and

means to energize said coil to generate an electromagnetic field in said magnetic core, said electromagnetic field generating circulating currents in said annular element to heat said print head to a temperature suitable for thermal printing.

4,536,776

INK-JET PRINTING DEVICE

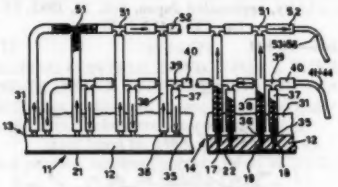
Franco Knirsch, Banchette; Giovanni Gianolini, Lozza; Gian D. Dagna, Ivrea, and Mario Buat, Carema, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Sep. 30, 1982, Ser. No. 431,279

Claims priority, application Italy, Oct. 5, 1981, 68285 A/81

Int. Cl.³ G01D 15/18

U.S. Cl. 346—140 R 12 Claims

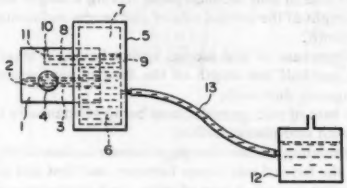


1. An ink jet printing device for dot printing alphanumeric characters and/or facsimile type graphics, comprising a plurality of containers for ink, a plurality of nozzles arranged on a common plate made of insulating material and closing said containers, each one of said nozzles being connected to a corresponding one of said containers and having an inner diameter of a few hundredths of millimeter, the ink having an electrical resistivity comprised between 15 and 50 ohm.cm and being in contact with a corresponding electrode, and a plurality of counterelectrodes each one located on said plate adjacent one of said nozzles and selectively energizable by a voltage pulse such as to produce both an ion discharge between the counter electrode and the meniscus of ink in the respective nozzle and a resistive current in the ink of the nozzle as to cause the expulsion of ink particles through the nozzle, said nozzles being disposed in said plate as to print in parallel in different zones of the paper.

4,536,777
LIQUID JET RECORDING APPARATUS

Haruyuki Matsumoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,357
Claims priority, application Japan, Apr. 21, 1983, 58-70823
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 PD 5 Claims

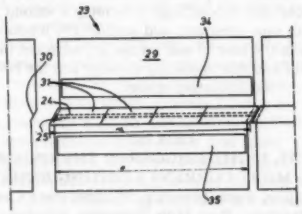


1. A liquid jet recording apparatus comprising a liquid jet section including orifice means for discharging a liquid to form flying droplets and liquid path means communicating with said orifice means and having as a part an energy acting portion for causing the energy to act on the liquid to form said flying droplets, and a liquid chamber communicating with said liquid path means and containing the liquid supplied to said liquid path means, characterized by an air vent path formed in a member defining said liquid jet section and used to extract air from said liquid chamber, said air vent path having an inlet opened to said liquid chamber and an outlet formed on said liquid jet section, and said air vent path being defined by a groove formed on a plate by etching, on which plate groove means defining said liquid path means is similarly formed.

4,536,778
RECORDING APPARATUS WITH MODULAR LED ARRAY OF HIGHER PRODUCTION YIELD

Lucien A. De Schamphelaere; Etienne M. De Cock, both of Edegem; Werner E. De Bondt, Temse; Freddy M. Librecht, Boechout; Gerard J. Boeve, Edegem, and Willy F. Van Peteghem, Berchem, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Oct. 26, 1982, Ser. No. 436,671
Claims priority, application United Kingdom, Feb. 19, 1982, 8205024
Int. Cl.³ G01D 15/14
U.S. Cl. 346—160 8 Claims



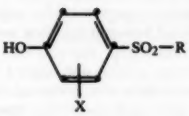
1. In a recording apparatus for linewise recording information on a photoreceptor moving along a fixed path, said apparatus comprising a recording head carrying a multiplicity of addressable and energisable pointlike radiation emitters arranged in at least one row having its length extending transversely of the path of the photoreceptor, said row being composed by the assembly in generally a line of a plurality of chip means each carrying a plurality of radiation emitters disposed in uniformly spaced apart relation in at least one row, and electrical control means for said radiation emitters, the improvement wherein said recording head comprises an elongated metal bar onto which a plurality of modules are fitted in good heat-conductive relationship, each such module comprises an electrically conductive base plate onto which a plurality of said emitter chip means is mounted generally in said line in generally abutting relation in good electrical and heat-conductive relationship, with the emitters thereof aligned in at least one extended row, the length (o) of each base plate parallel to the axis of the emitter row thereon being smaller than the aggregate length (n) of the chip means thereon so that on both ends of the base plate an end of a terminal chip means in said line extends beyond the boundary of the base plate, the spacing of the end edges of each chip means from the outermost radiation emitter thereon and the spacing of adjacent modules carrying said chip means being sufficiently close that at least one uninterrupted overall row of equally spaced radiation emitters is formed from the emitters of said modules along the length of the recording head, and said electrical control means is in the form of at least one elongated control chip mounted on each such module in common to each such extended row of emitters thereon, said control chip running parallel with its associated extended row of radiation emitters and being provided with a plurality of output terminals that are each connected by wire bonding to a corresponding radiation emitter, said control chip comprising integrated shift register means, latch register means and drivers, and also an input terminal for the serial-in loading of the shift register means and an output terminal for connection of the shift register means to the input terminal of the shift register means of the control chip of the next module.

4,536,779
HEAT-SENSITIVE RECORDING MATERIAL

Hermann Nachbur, Reinach, and Christel Tempel, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 1, 1983, Ser. No. 557,013
Claims priority, application Switzerland, Dec. 10, 1982, 7215/82
Int. Cl.³ B41M 5/18, 5/22
U.S. Cl. 346—212 10 Claims

1. A heat-sensitive recording material which comprises in its color reactant system, as developer for the color former, at least one aluminum or zinc salt of a phenolsulfonyl compound of the formula



(1)

wherein

R is C_1–C_{12}alkyl, cycloalkyl, phenyl, benzyl, or phenyl which is substituted by halogen, lower alkyl, lower alkoxy, nitro or methylenedioxy, and

X is hydrogen, halogen, lower alkyl or lower alkoxy.

4,536,780
SUPERCONDUCTIVE TUNNELING JUNCTION RESISTOR AND METHOD OF FABRICATION

Lawrence N. Smith, Lexington, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,603
Int. Cl.³ H01L 39/22, 39/12
U.S. Cl. 357—5 21 Claims

1. A junction device comprising:

(a) a substrate,

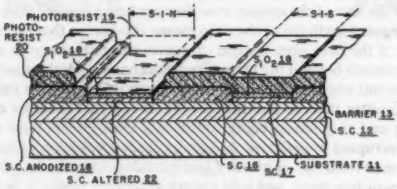
(b) a base layer of non-superconductive material,

(c) a first layer of superconductive material, characterized by a superconducting transition temperature and having a

thickness substantially less than the coherence length of said material,

(d) a second layer of superconductive material, superposed with respect to said first layer, and also characterized by a superconducting transition temperature, and

(e) a barrier between said first and second layers for conducting tunneling current therebetween,



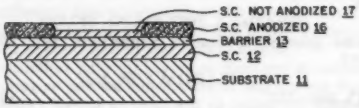
(f) said base layer deposited in at least one limited region so that said region remains in a substantially normal state and said junction device has a predetermined resistance when cooled to said superconducting transition temperature of said superconductive layer.

4,536,781

FABRICATION OF SUPERCONDUCTIVE TUNNELING JUNCTION RESISTORS AND SHORT CIRCUITS BY ION IMPLANTATION

Harry Kroger, Sudbury, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,604
Int. Cl.³ H01L *39/22, 39/12*
U.S. Cl. 357—5 **13 Claims**



1. In a junction device including:

a first layer of superconductive material, characterized by a superconducting transition temperature; a second layer of conductive material, superposed with respect to said first layer; a barrier layer between said first and second layers for conducting tunneling current therebetween; and means for providing at least one limited region wherein said junction device has a predetermined ohmic resistance when cooled to said superconducting transition temperature; said means comprising:

chemical impurities implanted into at least a portion of said barrier layer.

4,536,782

FIELD EFFECT SEMICONDUCTOR DEVICES AND METHOD OF MAKING SAME

Dale M. Brown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,898
Int. Cl.³ H01L *29/78*
U.S. Cl. 357—23.1 **8 Claims**

1. A field effect transistor comprising:

a substrate of semiconductor material of one conductivity type having a planar surface,

a recess in said planar surface of said substrate, said recess having first and second sides and a base therebetween,

a first insulating spacer including a first side, a second side, a bottom base and a top base,

the first side of said first spacer having a height equal to the height of the first side of said recess and contiguous therewith,

the bottom base of said first spacer having a length less than one-half of the length of the base of said recess and contiguous therewith,

the top base of said first spacer being substantially coplanar with said planar surface,

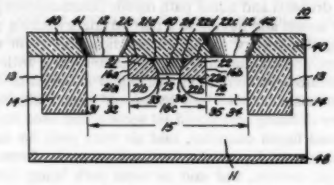
a second insulating spacer including a first side, a second side, a bottom base, and a top base,

the first side of said second spacer having a height equal to the height of the second side of said recess and contiguous therewith,

the bottom base of said second spacer having a length less than one-half the length of the base of said recess and contiguous therewith,

the top base of said second spacer being substantially coplanar with said planar surface,

a thin insulating member having a bottom surface contiguous with the base of said recess between said first and second insulating spacers, a pair of sides, each contiguous with a respective one of said second sides of said first and second insulating spacers,



a conductive member having a bottom base contiguous with the top surface of said thin insulating member, a top base extending between the second sides of said first and second insulating spacers, a first side contiguous with the second side of said first insulating spacer and a second side contiguous with the second side of said second insulating spacer,

a first region of opposite conductivity type in said substrate adjacent said planar surface and said first insulating spacer, said first region forming a first PN junction with said substrate, said first PN junction having an edge in the base of said recess and adjacent the bottom surface of said thin insulating member and the bottom base of said first insulating spacer,

a second region of opposite conductivity type in said substrate adjacent said planar surface and said second insulating spacer, said second region forming a second PN junction with said substrate, said second PN junction having an edge in the base of said recess and adjacent the bottom surface of said thin insulating member and the bottom base of said second insulating spacer.

4,536,783

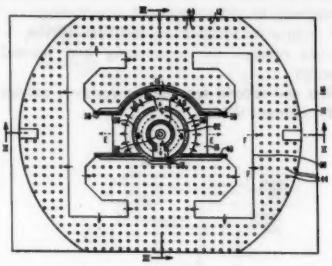
HIGH DI/DT, LIGHT-TRIGGERED THYRISTOR WITH ETCHED MOAT CURRENT LIMITING RESISTORS

Donald L. Miller, Penn Township, Westmoreland County, and John X. Przybysz, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 14, 1983, Ser. No. 550,849
Int. Cl.³ H01L *29/74*
U.S. Cl. 357—38 **8 Claims**

1. A light-triggered thyristor having a top surface, a bottom surface and an end portion extending therebetween, the thyristor being comprised of a first auxiliary cathode emitter region, a second auxiliary cathode emitter region, a main cathode emitter region, a cathode base region, an anode base region and an anode emitter region, a p-n junction between adjacent

regions, an optical well disposed in a central portion of the top surface of the thyristor and extending into only said cathode base region, three moats disposed in the top surface of the



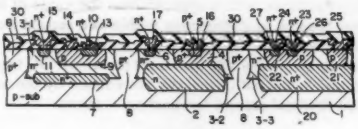
thyristor disposed about and spaced apart from said optical well, said moats each extending only into said cathode base region, said moats defining, within said cathode base region two current limiting resistors.

4,536,784

SEMICONDUCTOR DEVICE HAVING A JUNCTION CAPACITANCE, AN INTEGRATED INJECTION LOGIC CIRCUIT AND A TRANSISTOR IN A SEMICONDUCTOR BODY

Shuzo Nagumo, Koganei; Setsuo Ogura, Kodaira, and Yukinori Kitamura, Mitaka, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Continuation of Ser. No. 210,813, Nov. 26, 1980, abandoned. This application Oct. 13, 1983, Ser. No. 541,445
Claims priority, application Japan, Nov. 28, 1979, 54-152925
Int. Cl.³ H01L *27/04, 27/02, 29/92*
U.S. Cl. 357—48 **2 Claims**



1. A semiconductor device having a junction capacitance, an integrated injection logic circuit and a transistor in a semiconductor body, comprising:

a semiconductor layer of a first conductivity type which is formed on a semiconductor substrate of a second conductivity type opposite to said first conductivity type,

an isolation region which extends from a surface of said semiconductor layer to said substrate and which isolates said semiconductor layer into a first island region, a second island region, and a third island region,

a first semiconductor buried layer of said first conductivity type which is located between said first island region and said substrate, said first semiconductor buried layer having a higher impurity concentration than said first island region,

a second semiconductor buried layer of said first conductivity type which is located between said second island region and said substrate and which has an impurity concentration lower than that of said first semiconductor buried layer, said second semiconductor buried layer having a thickness greater than that of said first semiconductor buried layer,

a third semiconductor buried layer of said first conductivity type which is located between said third island region and said substrate, and which has an impurity concentration higher than that of said first buried layer,

a first semiconductor region of a second conductivity type which is selectively formed in said second island region and is contacted with said second semiconductor buried layer,

second and third semiconductor regions of said second conductivity type which are formed in said third island region in a manner to be spaced from each other,

a fourth semiconductor region of said first conductivity type which is formed in said second semiconductor region,

a fifth semiconductor region of said second conductivity type which extends from a surface of said first island region toward but is separated from said first buried layer, and

a sixth semiconductor region of said first conductivity type which is formed in said fifth semiconductor region,

a junction capacitance being formed by a PN junction between said first semiconductor region and said second semiconductor buried layer,

an integrated injection logic circuit being constructed of said third semiconductor buried layer, said third island region, said second semiconductor region, said third semiconductor region and said fourth semiconductor region,

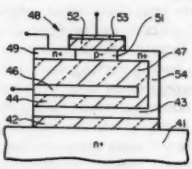
a transistor being constructed of said first island region, said fifth semiconductor region and said sixth semiconductor region, and wherein said first semiconductor buried layer contains a first impurity for defining said first conductivity type, said second semiconductor buried layer contains a second impurity for defining said first conductivity type and said third semiconductor buried layer contains said first and second impurities.

4,536,785

ONE TRANSISTOR DYNAMIC RANDOM ACCESS MEMORY

James F. Gibbons, 320 Tennyson Ave., Palo Alto, Calif. 94301

Filed Aug. 26, 1983, Ser. No. 526,912
Int. Cl.³ H01L *29/34*
U.S. Cl. 357—54 **6 Claims**



1. A dynamic random access memory cell comprising

a substrate;

a first insulating high dielectric layer having one surface on one surface of said substrate;

a conductive storage electrode on the other surface of said first insulating layer;

a second insulating layer having one surface on said storage electrode;

a capacitory plate on the other surface of said second insulating layer opposite and spaced from said storage electrode whereby said capacitor plate, storage electrode, substrate and insulating plates form a storage capacitor;

an oxide layer having one surface on said plate;

an access transistor including a thin layer of semiconductor material including spaced regions of one conductivity type separated by a region of opposite conductivity type and means for inducing in inversion layer in said region of opposite conductivity type, said transistor carried by the other surface of said oxide layer opposite the capacitor plate; and,

means for electrically connecting said transistor to said storage electrode.

4,536,786

LEAD ELECTRODE CONNECTION IN A SEMICONDUCTOR DEVICE

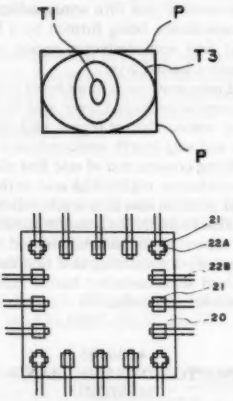
Masao Hayakawa, Kyoto; Takamichi Maeda, and Masao Kumura, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 826,635, Aug. 22, 1977, abandoned. This application May 17, 1979, Ser. No. 39,820

Claims priority, application Japan, Aug. 23, 1976, 51-113137[U]

Int. Cl.³ H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—68 **9 Claims**



1. A semiconductor device comprising a plurality of external leads to be bonded to a plurality of contacts by the application of a heat-bonding tool thereto, said heat-bonding tool exhibiting a nonuniform heat distribution, gradient when applied to said plurality of contacts and said plurality of external leads to be heat-bonded thereto, said plurality of contacts and external leads selectively having varying sizes and areas for varying the bonding area therebetween, thereby achieving effective bonding despite said nonuniform heat distribution of said heat-bonding tool, said variation in the bonding area between the contacts and external leads compensating for the variations in said heat distribution thereby establishing a substantially uniform bonding strength between said contacts and said external leads.

4,536,787

DEMODULATED CHROMINANCE SIGNAL FILTER WITH PEAKED RESPONSE

Wesley W. Murphy, III, and Saiprasad V. Naimpally, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 28, 1983, Ser. No. 489,302

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—38 **20 Claims**

13. In a system for processing a color television signal including a chrominance information component exhibiting a first amplitude level over a first frequency range and a second amplitude level lower than said first amplitude level over a second frequency range, frequency selective apparatus for imparting to said chrominance component a given amplitude-versus-frequency response including a peaked amplitude response over said second frequency range, comprising:

a first resonant section comprising an inductance and capacitance;

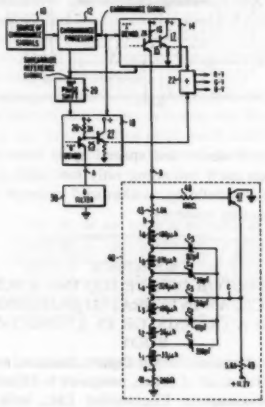
a second resonant section arranged in cascade with said first section and comprising an inductance and capacitance;

an intermediate resonant section coupled between and arranged in cascade with said first and second sections and comprising an inductance and capacitance;

a first resistor for terminating said first section;

a second resistor for terminating said second section; wherein

said first and second terminating resistors exhibit substantially different values;



said first resonant section presents to said first resistor an impedance which approximates the value of said first resistor, at a frequency within said second frequency range;

said second resonant section presents to said second resistor an impedance which approximates the value of said second resistor, at a frequency within said second frequency range; and

said frequency selective apparatus presents a DC impedance to said signal path primarily determined by the values of said first and second terminating resistors.

4,536,788

DEMODULATED CHROMINANCE SIGNAL FILTER USING IMPEDANCE MISMATCHED SECTIONS

Saiprasad V. Naimpally, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 26, 1983, Ser. No. 488,813

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—38 **23 Claims**

1. In a video signal processing system including a signal path for conveying video signals, frequency selective apparatus coupled to said signal path for translating signals conveyed by said signal path, comprising:

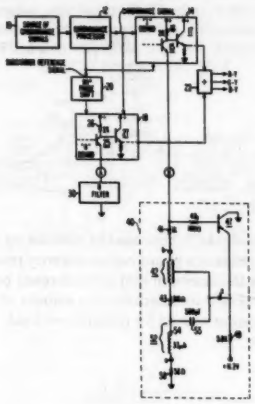
a first frequency selective section including parameters determinative of the frequency response of said first section;

a second frequency selective section including parameters determinative of the frequency response of said second section;

resistance means for passively connecting said first section to said second section, said resistance means being of a value to substantially preclude mutual interaction between the parameters of said first and second sections over a given range of signal frequencies within the passband of signals to be translated; and

means for exciting said first and second sections with signals

from said signal path to modify the amplitude-versus-frequency response of signals conveyed by said signal path,



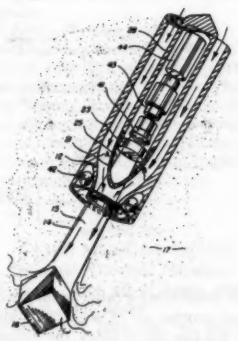
in accordance with the amplitude-versus-frequency responses of said first and second sections.

4,536,789

APPARATUS FOR OBSERVATION IN A HIGH VELOCITY LIQUID STREAM

Paul C. Bains, 1075 Goldstream Ave., Victoria, British Columbia, Canada (V9B 2Y7)

Filed Aug. 8, 1983, Ser. No. 521,364
Claims priority, application Switzerland, Mar. 3, 1983, 422791
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—99 **28 Claims**



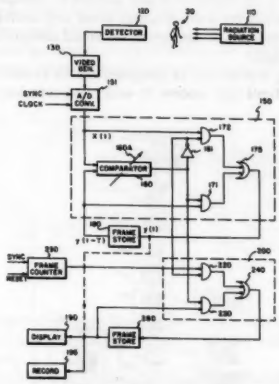
1. An apparatus comprising radiation receiving means for observing an object when the radiation receiving means is in a clear liquid stream flowing towards the object, the radiation receiving means comprising an observation window and cavitation prevention means disposed adjacent the observation window downstream thereof, the cavitation prevention means substantially assuming the shape of a zone of cavitational probability of a downstream end of the radiation receiving means when in a liquid stream of a selected velocity at which cavitation is possible, said cavitation prevention means thereby preventing cavitation when the liquid stream passes said downstream end of the radiation receiving means at or below the selected velocity.

4,536,790

APPARATUS AND METHOD FOR FLUOROSCOPIC IMAGING OF A BODY

Robert A. Kruger, Sandy, Utah, and Wayne Bateman, Sunnyvale, Calif., assignors to Thomson-CSF Broadcast, Inc., Stamford, Conn.

Filed Nov. 26, 1982, Ser. No. 444,614
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—111 **17 Claims**



1. A method for generating a processed video image of a fluid-carrying vessel in a body, comprising the steps of:

injecting a contrast medium to pass into the vessel;

irradiating the body;

detecting radiation which passes through the body and generating a series of frames of electronic video signals that represent an image of the radiation transmission characteristics of the body at a series of successive times, each frame including an array of pixels, the video signal level at each pixel being determined by the radiation transmissivity of an elemental region of the body;

determining the time at which the video signal level at each pixel is indicative of maximum opacification of the elemental body region corresponding to the pixel;

storing, for each pixel, a time-representative value which depends on the determined time; and

displaying a processed video image which has a video parameter that depends, at each pixel, on the time-representative value for the pixel.

4,536,791

ADDRESSABLE CABLE TELEVISION CONTROL SYSTEM WITH VIDEO FORMAT DATA TRANSMISSION

John G. Campbell, Irving; Carl F. Schoeneberger; Allan B. Bundens, both of Carrollton; Richard M. Fogle, Bedford, and John R. Lemburg, Richardson, all of Tex., assignors to Tocom, Inc., Dallas, Tex.

PCT No. PCT/US81/00414, § 371 Date Nov. 27, 1981, § 102(e) Date Nov. 27, 1981, PCT Pub. No. WO81/02961, PCT Pub. Date Oct. 15, 1981
Continuation of Ser. No. 348,937, Nov. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 135,987, Mar. 31, 1980, abandoned. This PCT application Mar. 31, 1981, Ser. No. 617,137
Int. Cl.³ H04N *7/16*; H04K *1/04*
U.S. Cl. 358—122 **8 Claims**

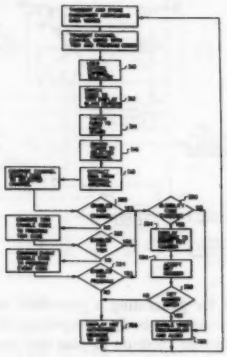
1. In a television communications system having a central station for transmitting a plurality of television signals at different frequency channels to a plurality of user stations remote from said central stations, each having a tuner for selecting one of said television signals, a method of utilizing said central

station to limit access of said user stations to only certain ones of said television signals, comprising:

generating a plurality of category codes at said central station to limit user access to predetermined categories of said television signals, one of said category codes being generated for each user station, each said category code including predetermined enabling data required by the central station for said user station to access said predetermined categories of television signals;

transmitting each of said category codes from the central station to its respective user station to precondition each user station by authorization from the central station to selectively access said predetermined categories of television signals;

generating a plurality of program codes at said central station to limit user access to said predetermined categories



of television signals, one of said program codes being generated for each television signal, each of said program codes including predetermined control data for enabling access to one of said television signals;

transmitting one of said program codes with each of said television signals to each of said user stations being tuned to receive one of said television signals;

comparing the control data of said program code to the enabling data of the category code provided by the central station to each user station; and

enabling only each user station which has a category code with enabling data corresponding to the control data of said program code, whereby said enabled user station can receive and process any said tuned television signal within a predetermined category of said television signals corresponding to said category code.

4,536,792

METHOD AND APPARATUS FOR TESTING A CRT DISPLAY UNDER BEAM DUTY CYCLE VARIATION

John H. Harshbarger, Xenia, Ohio, assignor to Visual Information Institute, Inc., Xenia, Ohio

Filed Nov. 23, 1983, Ser. No. 554,843

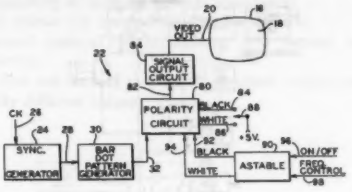
Int. Cl.³ H04N 7/02

U.S. Cl. 358—139 **23 Claims**

1. A method of testing the geometry of a raster scan under beam duty cycle variation comprising:

generating by the electron beam of a cathode ray tube on the display screen thereof a pattern comprising a plurality of graphic elements defining a plurality of reference points on the screen, said graphic elements being one of a high intensity or low intensity level on a screen background of the other of a high intensity or low intensity level and wherein the graphic elements occupy a very low percentage of the scanned screen area and the background occupies a very high percentage of the scanned screen area,

reversing the polarity of the graphic elements and screen background to cause the background to be said one of the high intensity and low intensity levels and the graphic elements to be said the other of the high intensity and low intensity levels, and



measuring the distance between the position on the screen of one of the reference points before polarity reversal and the position on the screen of said one reference point with the polarity reversed to determine the amount of deviation in display location caused by polarity reversal.

4,536,793

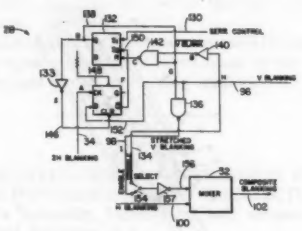
PULSE STRETCHING CIRCUIT FOR A RASTER DISPLAY

John H. Harshbarger, Xenia, and William M. Shores, Dayton, both of Ohio, assignors to Visual Information Institute, Inc., Xenia, Ohio

Filed Jan. 10, 1983, Ser. No. 456,851

Int. Cl.³ H04N 5/06

U.S. Cl. 358—150 **16 Claims**



1. A system for controlling a raster beam generating one set of scan fields and another set of scan fields alternately time interleaved with the first set of fields, the system comprising: means for developing a plurality of time sequential horizontal rate control pulses synchronized with the horizontal sweep of the beam and occurring at a frequency at least as high as the frequency of the horizontal sweep, means for developing a plurality of time sequential vertical rate control pulses occurring at the same rate as the sets of scan fields, the vertical rate pulses having a lower frequency than the horizontal rate pulses, the vertical rate pulses normally having a shorter duration in one set of fields than the vertical rate pulses in the other set of fields, and pulse stretching means responsive to the horizontal and vertical rate pulses for increasing the duration of the shorter duration vertical rate pulses in the one set of fields to equal the duration of the vertical rate pulses in the other set of fields.

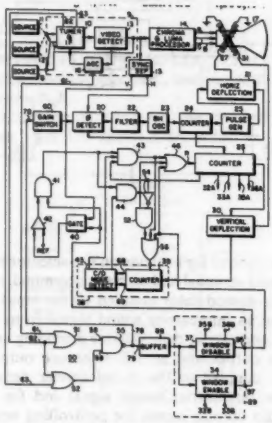
4,536,794
TELEVISION RECEIVER HAVING DIFFERENT RECEIVER SYNCHRONIZING CHARACTERISTICS IN RESPONSE TO TELEVISION SIGNAL

Ronald E. Fernsler, and Sanjay R. Vinekar, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 30, 1982, Ser. No. 394,038

Int. Cl.³ H04N *5/04, 3/18*

U.S. Cl. 358—158 **16 Claims**



1. A television receiver comprising:

means for receiving picture information signals from first and second different signal source types incorporating means responsive to tuner operation for producing a plurality of signals representative of respective features associated with said signal source types;

logic means responsive to said plurality of signals for identifying the signal source type providing said picture information signals;

a receiver deflection system; and

receiver synchronizing means coupled to said receiving means and said deflection system for synchronizing operation of said deflection system with respect to said picture information signals, said receiver synchronizing means coupled to said logic means and operating in a first mode in response to identification of said first signal source type and operating in a second mode in response to identification of said second signal source type.

4,536,795
VIDEO MEMORY DEVICE

Akira Hirota, Chigasaki; Hiroyuki Miyahara, Yokohama, and Yoshiteru Kosaka, Zushi, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Feb. 4, 1983, Ser. No. 463,934

Claims priority, application Japan, Feb. 4, 1982, 57-16647; Feb. 4, 1982, 57-16648; Feb. 4, 1982, 57-16649; Feb. 4, 1982, 57-16650

Int. Cl.³ H04N *5/14, 3/14*

U.S. Cl. 358—160 **8 Claims**

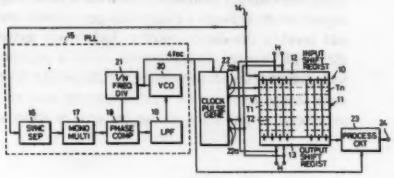
1. A video memory device comprising:

an analog memory part in which memory elements are arranged in a matrix form with a plurality of rows and a plurality of columns for storing an input analog video signal including a time base fluctuation component, the memory elements of said analog memory part comprising transfer elements for simultaneously transferring signals in each column to a succeeding row in parallel for each of the rows;

an input circuit for applying the input analog video signal to the analog memory part and for causing the analog memory part to store the input analog video signal, said input circuit comprising an input shift register for simultaneously transferring signals in each column to said analog memory part in parallel after serially transferring the input analog video signal for each of said columns;

an output circuit for obtaining an analog video signal delayed by a predetermined delay time from said analog memory part, said output circuit comprising an output shift register for serially transferring signals in each column transferred in parallel from said analog memory part and producing the analog video signal delayed by said predetermined delay time;

a clock pulse generator for generating and applying a clock pulse for horizontal transfer to said input shift register and



said output shift register, and for generating and applying a clock pulse for vertical transfer to said analog memory part; and

a phase locked loop including separating means for separating a horizontal synchronizing signal from said input analog video signal, a phase comparator supplied with the separated horizontal synchronizing signal, and a voltage controlled oscillator variably controlled of its oscillation frequency by an output error signal of said phase comparator for supplying an oscillation output to said phase comparator, said output of said voltage controlled oscillator being also supplied to said clock pulse generator to cause said clock pulse generator to generate said clock pulses.

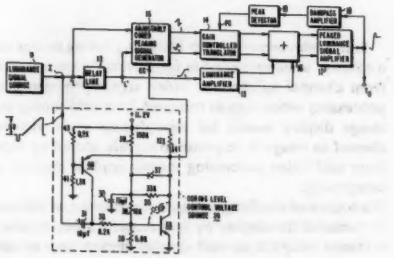
4,536,796
NON-LINEAR DYNAMIC CORING CIRCUIT FOR VIDEO SIGNALS

Wayne E. Harlan, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 23, 1983, Ser. No. 525,682

Int. Cl.³ H04N *5/14, 5/21*

U.S. Cl. 358—166 **6 Claims**



1. In a video signal processing system including a source of video signals representative of image content between dark and bright extremes, a dynamic signal coring circuit comprising:

means, coupled to said source, for developing a cored version of a signal representative of the high frequency content of said video signals in response to a coring control

signal applied to a control input of said developing means; and

control means, with an input coupled to said source and an output coupled to said control input of said developing means, for providing to said control input a control signal in accordance with the magnitude of video signals from said source, said control signal exhibiting a sense for causing said developing means to produce a greater amount of coring for video signals representative of dark image content than for video signals representative of bright image content; wherein said control means comprises

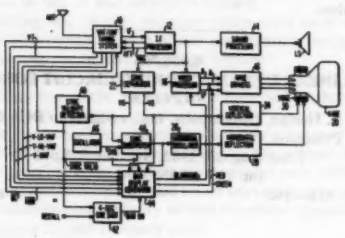
signal translating means responsive to video signals from said source and exhibiting a non-linear control characteristic for producing at an output thereof said control signal with one control characteristic over a first range of video signal levels betwen a bright image extreme and a threshold level in the direction of a dark image extreme, and a different control characteristic over a second range of video signal levels between said threshold level and said dark image extreme for restricting the amount of coring produced as said dark image extreme is approached.

4,536,797

TELEVISION RECEIVER WITH AUXILIARY ON-SCREEN DISPLAY

Robert J. Maturo, Brick; Danny Chin, Plainsboro, and John G. N. Henderson, Princeton, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 12, 1983, Ser. No. 541,075
Int. Cl.³ H04N 5/44, 5/22
U.S. Cl. 358—192.1 **4 Claims**



1. In a television receiver including tuning means comprising a channel selector operable for selectably tuning said receiver from channel to channel; video signal processing means for processing video signals received from said tuning means; and image display means for reproducing on a viewing screen thereof an image in response to signals, including video signals from said video processing means, applied thereto, apparatus comprising·

a source of auxiliary signal representative of character information for display by said image display means;

means coupled to said display means and to said tuning means for selectively blanking said display means to produce a uniformly blanked screen display when said receiver is not tuned to a channel containing a predetermined amount of video information as said receiver is being tuned through a number of channels; and

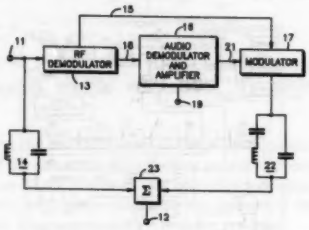
means for coupling said auxiliary signal to said display means for enabling said character information to be superimposed on said blanked screen display.

4,536,798

VOLUME CONTROL FOR CATV AND METHOD THEREFOR

Sydney J. Reid, Jr., Tempe, and Fredrick Zlotnick, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 20, 1983, Ser. No. 506,152
Int. Cl.³ H04N 5/62, 7/16
U.S. Cl. 358—197 **4 Claims**



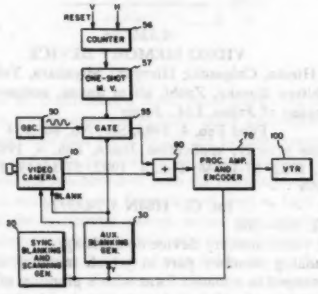
1. Volume control for a television pre-selector tuning system having an input terminal and an output terminal, comprising: a sound carrier demodulator coupled to the input terminal for demodulating an intercarrier sound signal from an RF input signal, the sound carrier demodulator providing an intercarrier sound signal output and an RF reference output; an audio demodulator coupled to the sound carrier demodulator for receiving the intercarrier sound signal and for providing a detected audio output; means for controlling amplitude coupled to the audio demodulator for receiving the detected audio and for controlling amplitude of the detected audio; a modulator coupled to the means for controlling amplitude and coupled to the RF reference output for remodulating the detected audio with the RF reference output and providing a remodulated output; and a means for summing coupled to the remodulating output and the input terminal for summing the remodulated output, which contains the amplitude controlled audio, with a video portion of the RF input.

4,536,799

TELEVISION METHOD AND APPARATUS

Renville H. McMann, Jr., New Canaan, Conn., assignor to Thomson-CSF Broadcast, Inc., Stamford, Conn.

Filed Sep. 29, 1982, Ser. No. 427,899
Int. Cl.³ H01N 5/38
U.S. Cl. 358—219 **16 Claims**



1. A television system, comprising:

a television camera;

means for generating periodic field scanning signals;

means for applying said field scanning signals to said television camera;

means for disabling the scanning beam of said television camera during a predetermined non-unity fraction of a series of field times so that in the output of said camera a regular video field is followed by at least one blanked-out video field;

means responsive to said disabling means for inserting an identifying signal in each blanked-out field;

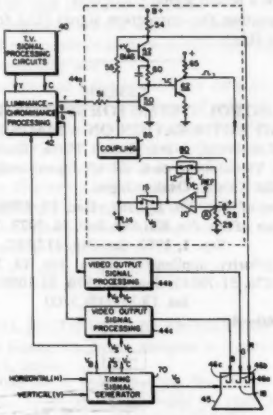
means for generating, during occurrence of each blanked-out field, a substitute video field derived from a previously occurring regular video field.

4,536,800

ADDITIVE PULSE SAMPLING CIRCUIT

Robert P. Parker, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1982, Ser. No. 445,513
Int. Cl.³ H04N *5/68, 9/16*
U.S. Cl. 358—243 **19 Claims**



1. In a signal processing system, apparatus operative during a reference interval and a subsequent sampling interval for sampling the magnitude of an input signal, comprising:

sampling means for providing an output signal in accordance with the magnitude of input signals supplied thereto;

input circuit means for coupling said input signal to an input of said sampling means;

means for selectively coupling a bias current derived from a reference source to said input circuit means via a reference path during said reference interval to establish a sampling reference bias condition, and for decoupling said reference path at the end of said reference interval; and

passive network means associated with said input circuit means for self-generating an auxiliary reference signal at said input of said sampling means in response to said reference path being decoupled at the end of said reference interval, said auxiliary reference signal exhibiting a magnitude and sense for substantially negating the response of said sampling means to said input signal when the magnitudes of said input signal and said auxiliary reference signal exhibit a prescribed mutual relationship.

4,536,801

VIDEO DATA COMPRESSION SYSTEM AND METHOD

John Torkelson, Dallas, and Weldon A. Sanders, Jr., Sengoville, both of Tex., assignors to BancTec, Inc., Dallas, Tex.

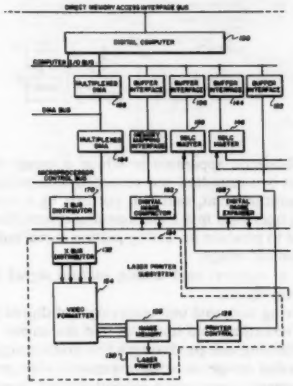
Filed Oct. 1, 1981, Ser. No. 307,686
Int. Cl.³ H04N *1/05*
U.S. Cl. 358—280 **3 Claims**

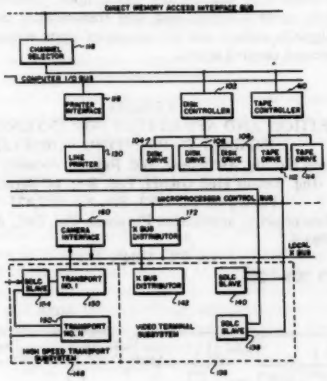
1. A video data compression system for data compression of signals representative of the video image of a document, said system comprising:

(a) means for continuously transporting said document along a first directional path;

(b) means for video scanning said document during said continuous transporting and in a direction transverse to said first directional path, said video scanning means producing coded signals respectively representative of black and white sections of the image of said document;

(c) said video scanning means further comprising means for producing a plurality of consecutive scans in said transverse direction;





(d) means for comparing the coded signals of one scan with the coded signals of a prior scan to compare the nature of adjacent ones of said sections in an axis parallel to said first directional path;

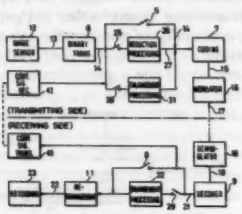
(e) means for generating unique redundancy codes indicative of unique relationships resulting from said comparison of adjacent sections; and

(f) means for deleting from memory those coded signals indicative of the sections having the said unique relationships and replacing said deleted signals with said unique redundancy codes.

4,536,802
FACSIMILE APPARATUS

Masami Kurata, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1983, Ser. No. 455,459
Claims priority, application Japan, Jan. 8, 1982, 57-920
Int. Cl.³ H04N 1/04
U.S. Cl. 358—287 13 Claims



1. A facsimile apparatus in which a image of an original document is transmitted and recorded, comprising:

a transmitting unit, said unit performing a sequential scanning operation in a main scanning direction on said document to produce an analog picture signal indicative of the document image;

means to convert said analog picture signal into a digital picture signal;

a receiving unit, said unit receiving said digital picture signal and recording said image of said document,

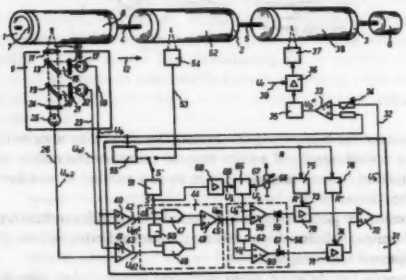
said receiving unit producing a first control signal when said recorded image is to be expanded with respect to said document image and a second control signal when said recorded image is to be reduced with respect to said document image;

wherein said receiving unit is set to digitally expand at least a portion of said picture signal upon generation of said first control signal, and said transmitting unit is set to digitally reduce said picture signal upon reception of said second control signal.

4,536,803
METHOD AND APPARATUS FOR INTENSIFYING CONTRAST IN PRINTING FORMATS

Eberhard Hennig, Aschebeng, Fed. Rep. of Germany, assignor to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,471
Claims priority, application European Pat. Off., Jul. 9, 1982, 82105964.9
Int. Cl.³ H04N 1/40
U.S. Cl. 358—299 19 Claims



1. A method for intensifying contrast during the recording of masters, wherein a master is opto-electronically scanned image-point-by-image-point and line-by-line in order to generate an image signal and a correction signal which is superimposed on the image signal for intensifying contrast, comprising the steps of

(a) generating a first unsharp masking signal (U_{u1}) by means of identifying the mean brightness of a first unsharp masking area (28) surrounding the respective image point on said master;

(b) generating a second unsharp masking signal (U_{u2}) by means of identifying the mean brightness of a second unsharp masking area (29) surrounding said respective image point and which is larger than said first unsharp masking area (28);

(c) forming a first differential signal (U_{d1}) from the image signal (U_b) and the first unsharp masking signal (U_{u1});

(d) forming a second differential signal (U_{d2}) from the image signal (U_b) and the second unsharp masking signal (U_{u2});

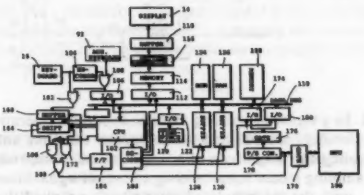
(e) mixing multiples of the first and second differential signals (U_{d1}; U_{d2}) with each other in a selectable ratio to obtain a mixed signal (U_m); and

(f) generating the correction signal (U_k) from said mixed signal (U_m).

4,536,804
DATA CONTROL SYSTEM FOR STORING DIGITAL AND AUDIO INFORMATION ON A MAGNETIC TAPE

Takeshi Kasubuchi, Nara; Takeo Hara, Ikoma, and Kaoru Ozawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 218,361, Dec. 19, 1980, which is a continuation of Ser. No. 806,483, Jun. 14, 1977. This application Sep. 1, 1982, Ser. No. 413,882
Claims priority, application Japan, Jun. 14, 1976, 51-70017; Jun. 14, 1976, 51-70018; Sep. 10, 1976, 51-109012
Int. Cl.³ G11B 5/00
U.S. Cl. 360—4 2 Claims



1. An electronic information processing apparatus capable of operating in at least a data processing mode or calculator operation mode comprising:

keyboard means for introducing digital or calculator information into said information processing apparatus;

means for converting said digital information into analog information;

magnetic tape recorder means for recording said analog information received from said keyboard means onto a magnetic tape, said tape recorder means being capable of operating in a normal record mode, a playback mode, a fast forward and a fast rewind mode;

control circuit means for controlling the recordation of said analog information onto said magnetic tape in a predetermined format wherein said format includes,

a plurality of individual data sections having said information recorded therein, each of said data sections being separated from one another by a certain distance on said magnetic tape, and

a plurality of block number codes corresponding, respectively, to said plurality of data sections, said block number codes being indicative of the modes of operation of said information processing apparatus and the type of information recorded on said magnetic tape, each of said block

number codes including a first section, used in the normal record modes and the playback mode of said tape recorder means and a second section, directly adjacent said first section, used in the fast forward and fast rewind modes of said tape recorder means,

wherein said first section and said second section of said block number codes each include,

a first plurality of bits, and

a second plurality of bits directly adjacent to said first plurality of bits, said second plurality of bits being the same bits and containing the same information as said first plurality of bits,

whereby said block number codes on said magnetic tape are detectable by said magnetic tape recorder means when said magnetic tape is driven to travel in a forward direction and in a reverse direction,

wherein said first and second plurality of bits each include,

a bit for determining the type of said information being recorded on said magnetic tape, and

a bit to distinguish between a data write-in mode and a data read out mode of said electronic information processing apparatus; and

display means positioned behind said keys on said keyboard means for displaying indicia indicative of numeral keys and function keys required for introducing calculator information into said electronic information processing apparatus when said apparatus is operating in a calculator operation mode, and for displaying indicia indicative of numerals and characters required for introducing digital information into said apparatus when said information processing apparatus is operating in a data processing mode.

4,536,805

IMAGE SIGNAL RECORDING-REPRODUCING DEVICE

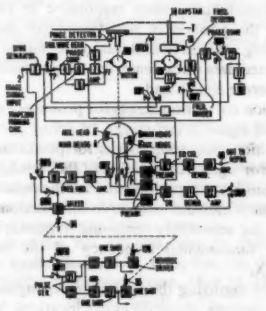
Masaya Maeda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,317

Claims priority, application Japan, Jul. 15, 1981, 56-110518; Jul. 15, 1981, 56-110519; Jul. 15, 1981, 56-110520

Int. Cl.³ H04N *5/782*; G11B *27/00*

U.S. Cl. 360—14.1 **12 Claims**



1. A video signal recording and reproducing apparatus, comprising:

(a) a recording head for recording a first video signal on a recording medium;

(b) a reproducing means for tracing a track traced by the recording head after an elapse of a predetermined period of time and reproducing the first video signal;

(c) applying means for applying a second video signal;

(d) mixing means for mixing the first video signal with the second video signal to form a third video signal and for supplying the third video signal to the recording head.

4,536,806

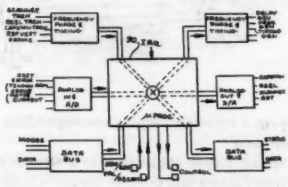
MICROPROCESSOR CONTROLLED MULTIPLE SERVO SYSTEM FOR A RECORDING AND/OR REPRODUCING APPARATUS

Kenneth Louth, Los Altos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,725

Int. Cl.³ G11B *5/52, 15/46, 21/04*

U.S. Cl. 360—69 **16 Claims**



1. A microprocessor-controlled multiple servo system for an apparatus having a head which is rotated relative to a magnetic tape that is moved past the head to record and reproduce video information on the tape in discrete tracks, comprising:

a transducing head for recording and/or reproducing video information on a magnetic tape;

a head scanner servo system for rotating said transducing head during recording and/or reproducing of video information on the tape, said head scanner servo system including means for producing output pulses indicative of the rotational position and velocity of said head;

a servo system for controlling the longitudinal velocity of magnetic tape being transported past said head, said servo system including means for producing a signal indicative of the longitudinal tape velocity; and

a microprocessor which forms a component part of each of said servo systems, said microprocessor receiving said scanner servo system output pulses as timing signals and, in response thereto, determining the rotational position and velocity of said head and producing a control signal to regulate the position and velocity of said head, said microprocessor also being responsive to said timing signals to sample said signal from said longitudinal velocity controlling system and produce an additional control signal to regulate longitudinal tape velocity.

4,536,807

DISPLAY DEVICE FOR A MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

Hiroshi Kato, Chigasaki, and Hiromitsu Kubota, Kawasaki, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 26, 1983, Ser. No. 545,759

Claims priority, application Japan, Nov. 1, 1982, 57-192258; Nov. 1, 1982, 57-192260

Int. Cl.³ G11B *27/14*

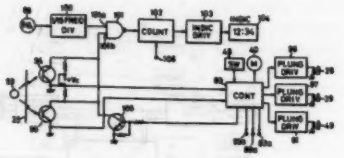
U.S. Cl. 360—72.3 **8 Claims**

1. A display device for a magnetic tape recording and/or reproducing apparatus, said recording and/or reproducing apparatus having a pinch roller and a capstan to receive and drive a magnetic tape, said display device comprising:

pulse generating means for generating pulse signals having a frequency which corresponds to a rotatinal speed of said capstan;

counter means responsive to said pulse generating means for counting the pulse signals from said pulse generating means to give a real-time readout;

indicator means responsive to said counter means for displaying a real-time display corresponding to the counted result; and



interrupting means responsive to a stopping of tape travel for interrupting said counter means to stop the counting of the pulse signals from said pulse generating means;

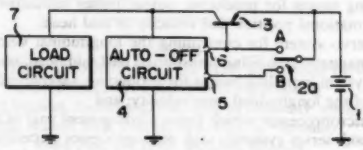
said indicator means displaying in real-time, a quantity of tape travel as said magnetic tape is driven responsive to said capstan.

4,536,808

TAPE RECORDER DEVICE HAVING AN AUTOMATIC SHUT-OFF CIRCUIT

Kenji Fujibayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1983, Ser. No. 478,072
Claims priority, application Japan, Apr. 2, 1982, 57-47817[U]
Int. Cl.³ G11B *15/48, 15/18*
U.S. Cl. 360—74.2 **1 Claim**



1. A tape recorder control device comprising:

a control transistor having a collector-emitter path which is connected between a power source and load circuit;

an automatic shut-off circuit connected in parallel with the load circuit on the output side of said control transistor and having a voltage-detecting terminal and an output terminal, said output terminal being connected to a base of said control transistor, said automatic shut-off circuit including:

means responsive to a voltage suddenly impressed on said voltage-detecting terminal for rendering said control transistor conductive through said output terminal; and

means responsive to the stopping of rotation of a reel of the tape recorder for rendering said control transistor nonconductive through said output terminal; and

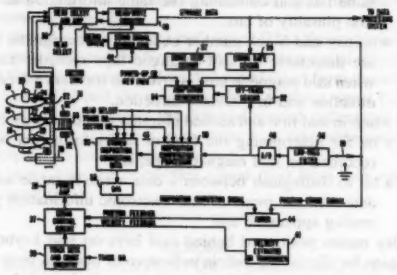
a switch having a first stationary contact connected to said voltage-detecting terminal of said automatic shut-off circuit, a second stationary contact connected to the base of said control transistor, and a common contact connected to the power source, said common contact being selectively contactable with one or the other of said first and second stationary contacts.

4,536,809

ADAPTIVE MISPOSITION CORRECTING METHOD AND APPARATUS FOR MAGNETIC DISK SERVO SYSTEM

Michael Sidman, Colorado Springs, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 10, 1982, Ser. No. 376,972
Int. Cl.³ G11B *21/10*
U.S. Cl. 360—77 **19 Claims**



9. In a transducer position system of a magnetic disk storage device including a disk medium for storing data, said disk medium including a plurality of data tracks located on concentric data track centerlines on a surface of the disk medium, at least one data track including embedded servo information from which track offsets can be measured, drive means for rotating said disk medium, transducer means for transferring data with said disk medium, movable carriage means supporting said transducer means for moving said transducer means over a selectable data track centerline of said disk medium, and servo control means responsive to a servo positioning-error signal and a misposition correction signal E for controlling said carriage means thereby to maintain said transducer means over a selectable data track centerline, said control means comprising:

A. servo positioning means responsive to the difference between the position of said transducer means and the transducing position of said transducer means with respect to a selected data track centerline for producing said servo position-error signal, and

B. misposition correction means for producing a misposition correction signal E including

i. misposition measuring means for producing a misposition error signal X indicative of the misalignment when said transducer is positioned over the data track centerline which includes said servo information,

ii. means for selectively removing harmonic components of the fundamental frequency of the position-error signal X,

iii. means for digitizing the position-error signal X at a plurality of discrete circumferential locations N about said position reference or measurement track thereby to produce an array X[n] of digital position-error samples X_n, and

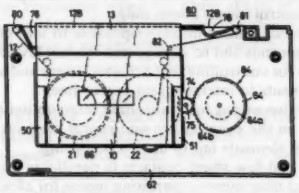
iv. transformation means having an impulse response h(n) for transforming the position-error samples X[n] by a digital filter whose transfer function h(n) includes an adjustable fundamental-frequency gain term A_{FF}, an adjustable offset gain term A_{DC}, or an adjustable phase lead term ϕ_A thereby to produce a misposition correction signal E that matches the response characteristics of the servo positioning system and the position-error measurement apparatus.

4,536,810

ADAPTER FOR A MINIATURE TYPE TAPE CASSETTE

Hiroyuki Umeda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 19, 1981, Ser. No. 322,767
Claims priority, application Japan, Nov. 25, 1980, 55-164705; Nov. 25, 1980, 55-167532[U]; Aug. 13, 1981, 56-119403[U]
Int. Cl.³ G11B *23/04*
U.S. Cl. 360—94 15 Claims



1. An adapter for a miniature type tape cassette which comprises a cassette case, supply side and take-up side reels and a tape accommodated within said cassette case, said cassette case having an external form and size which is smaller than the external form and size of a standard type tape cassette, axes of said supply side and take-up side reels being separated by a distance which is shorter than a distance between axes of two reels of said standard type tape cassette, said miniature type tape cassette also being used independently of said adapter when used with a recording and/or reproducing apparatus of a type which is different from a standard type recording and-/or reproducing apparatus, said adapter comprising:

an adapter case having an external form and size which is substantially equal to the external form and size of said standard type tape cassette so that the adapter may be loaded into said standard type recording and/or reproducing apparatus;

an accommodating part in said adapter for accommodating said miniature type tape cassette; and

stationary tape guide pole means fixed on said adapter case for guiding the tape after it has been manually drawn out of the miniature type tape cassette accommodated within the adapter case and threaded over said guide pole means, said stationary guide pole means supporting said tape along a predetermined tape path within said adapter case which corresponds to a tape path in said standard type tape cassette.

4,536,811

CASSETTE TAPE PLAYER HAVING SUPPLY AND TAKE-UP MOTORS POSITIONED VERTICALLY ABOVE A CASSETTE RECEIVING MECHANISM

Teturo Kamimura; Masahiro Komatsubara; Shizuo Ando, and Takugi Inanaga, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 151,980, May 21, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,564
Claims priority, application Japan, May 22, 1979, 54-067722
Int. Cl.³ G11B *15/00*
U.S. Cl. 360—96.6 1 Claim

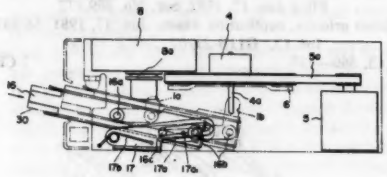
1. A motor arrangement for a slot-in type cassette type player for an automobile audio set, said cassette tape player comprising:

a player chassis extending generally horizontally;

a vertical front panel connected to said chassis to form a player structure, said front panel having a cassette insertion aperture therein;

receiving means, inclined with respect to horizontal and having its upper most inclined portion oriented at said insertion aperture, for receiving a cassette having a supply reel hub and a take-up reel hub from outside said player structure, said receiving means being pivotable to pivot said cassette to load it in a substantially horizontal position;

cassette drive means positioned vertically above said cassette receiving means, said drive means including a supply reel motor and a take-up reel motor, each positioned over a respective hub of the cassette when loaded in said horizontal position; and



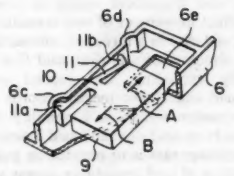
gearing means for providing direct drive between said motors and said cassette, including a supply reel shaft and a take-up reel shaft extending vertically downward from said supply reel motor and said take-up reel motor into said supply reel hub and said take-up reel hub, respectively, of the cassette loaded in said substantially horizontal position.

4,536,812

MAGNETIC DISK CARTRIDGE

Kengo Oishi, and Osamu Suzuki, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1984, Ser. No. 602,119
Claims priority, application Japan, Apr. 22, 1983, 58-60449[U]
Int. Cl.³ G11B *23/02, 15/04, 19/04*
U.S. Cl. 360—133 5 Claims



1. A magnetic disk cartridge having a case and a magnetic disk rotatably housed in the case, the magnetic disk cartridge comprising:

(i) a slide valve for prevention of erroneous erasure, which is supported in said case in a manner slidable in the direction normal to the thickness of said magnetic disk,

(ii) a detection hole positioned at one part of said case, said detection hole being closed by said slide valve when said slide valve is positioned at a predetermined sliding position, and

(iii) an engagement means comprising a lock arm which is positioned on a side face of said slide valve integrally therewith extending in parallel therewith and which exhibits resiliency in the direction normal to the body of said slide valve, a pair of projections positioned one at either end of said lock arm, and a pair of recess portions positioned integrally with said case for receiving and retaining said projections of said lock arm, whereby one of said pair of projections is retained and stopped in one of said pair of recess portions when said slide valve is at the sliding position for closing said detection hole and the other of said pair of projections is retained and stopped in the other

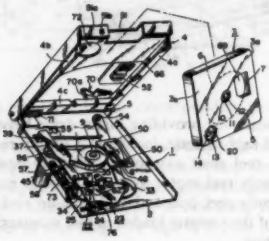
of said recess portions when said slide valve is at the sliding position for opening said detection hole.

4,536,813

MAGNETIC DISC RECORDING AND/OR REPRODUCING APPARATUS

Etsuro Saito, Ayase, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,277
Claims priority, application Japan, Jun. 17, 1981, 56-93215
Int. Cl.³ G11B *23/02, 5/012, 17/00*
U.S. Cl. 360—137 **7 Claims**



1. Apparatus for recording and/or reproducing information signals on a rotatable magnetic disc contained in a jacket provided with indicator means; said apparatus comprising:

transducer means mounted for cooperation with said disc;

drive means engageable with said disc for rotating said disc at a first average speed to effect movement of said disc with respect to said transducer means in a direction substantially parallel to the circumferential direction of said disc; and

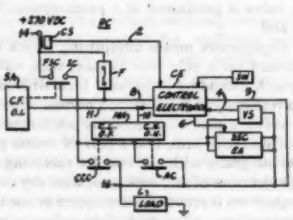
indexing means connected to said transducer means and engageable with said indicator means; said indexing means translating said transducer means at a second average speed to effect movement of said transducer means with respect to said disc in a direction substantially parallel to the radial direction of said disc, said first average speed substantially exceeding said second average speed, whereby said transducer means records and/or reproduces information signals in a plurality of substantially circular tracks on said disc; and said indexing means driving said indicator means to provide an indication related to the position of said transducer means with respect to said disc.

4,536,814

D. C. POWER CONTROLLER WITH FUSE PROTECTION

Peter J. Theisen, West Bend, and C. Gregory Chen, Brown Deer, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 26, 1984, Ser. No. 593,324
Int. Cl.³ H01H *33/14*
U.S. Cl. 361—7 **5 Claims**



1. A D.C. power controller for effectively interrupting a high voltage high current D.C. power line supplying a load from a D.C. power supply source comprising:

power contacts in said power line;

actuator means for closing and opening said power contacts;

arc extinguishing means associated with said power contacts;

means for initiating "close" and "open" commands;

arc-shunting solid state elements in parallel with said power contacts and controllable to receive the arching current from said power contacts and to interrupt the same;

and control means comprising:

electronic control means responsive to said close and open commands and to voltage and current levels in the power line for controlling said actuator means and said solid state elements to interrupt said power line;

protective means for controlling interruption of said power line in the event either said power contacts or said solid state elements fail to do so comprising:

a fuse and fuse shunt contacts in parallel in said power line;

said actuator means comprising means for closing and opening said fuse shunt contacts;

said electronic control means also comprising means for controlling said actuator means to close first and open last said fuse shunt contacts with respect to said power contacts such that said fuse will blow to interrupt the power line in the event either said power contacts or said solid state elements fail to do so;

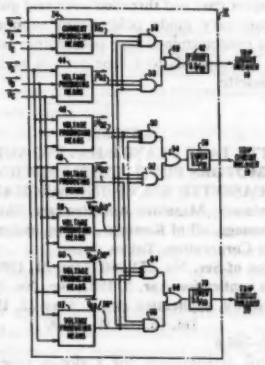
and means supplying operating power to said electronic control means from said D.C. power supply through said fuse so that in the event said fuse blows said electronic control means becomes inoperative and cannot be used to reclose said power contacts to be left unprotected.

4,536,815

PROTECTIVE RELAY APPARATUS AND METHOD FOR PROVIDING SINGLE-POLE TRIPPING

Hung J. Li, and Leonid Husak, both of Coral Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 29, 1983, Ser. No. 527,602
Int. Cl.³ H02H *3/16*
U.S. Cl. 361—47 **11 Claims**



1. Protective relay apparatus for detecting a single-phase-to-ground fault in a three-phase electrical power system and for identifying the faulted phase conductor, said protective relay apparatus comprising:

means for providing a first phasor signal representative of unbalanced current in the three-phase electrical power system,

means for providing a second phasor signal for each phase conductor representative of a negative sequence component of an electrical quantity for each phase conductor;

means for providing a third phasor signal for each phase conductor representative of a quadrature voltage for each phase conductor advanced by a predetermined number of electrical degrees;

coincidence means for determining the coincidence of said first, second, and third phasor signals for each phase conductor;

said coincidence means providing a signal indicating the occurrence of a single-phase-to-ground fault on an identified phase conductor when the phase angles of said first, second, and third phasor signals for the identified phase conductor have a predetermined relationship.

4,536,816

THYRISTOR APPARATUS EMPLOYING LIGHT-TRIGGERED THYRISTORS

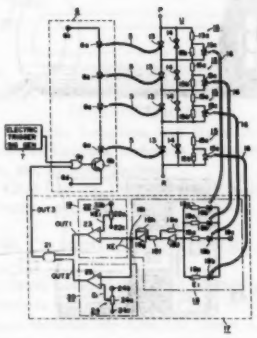
Susumu Matsumura, Osaka; Masao Yano; Nobuo Sashida, both of Kobe, and Yoshihiko Yamamoto, Amagasaki, all of Japan, assignors to Susumu Jatsumura, Osaka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed May 24, 1983, Ser. No. 497,495

Claims priority, application Japan, Jul. 12, 1982, 57-120835

Int. Cl.³ H02H *7/10*

U.S. Cl. 361—91 **8 Claims**



1. A thyristor apparatus employing light-triggered thyristors, comprising:

a plurality of light-triggered thyristors (13) connected in series and responsive to light trigger signals to be turned on,

light trigger signal generating means (6) optically connected to said light-triggered thyristors for providing light trigger signals for said light-triggered thyristors,

a plurality of overvoltage suppressing means (14) connected in parallel with said light-triggered thyristors, respectively, for suppressing overvoltages to be impressed on said light-triggered thyristors,

a forward voltage detector comprising a plurality of forward voltage detecting means (15) connected in parallel with said light-triggered thyristors, respectively, for detecting forward voltages applied to said light-triggered thyristors and for generating detected signals, and

thyristor number detecting means (17) connected to said light trigger signal generating means and to said forward voltage detector and responsive to said detected signals for activating said light trigger signal generating means when the number of light-triggered thyristors to which forward voltages are applied is one or more but not more than a predetermined number (K),

said thyristor number detecting means (17) comprising;

first voltage generating means (18) connected to said forward voltage detector, responsive to said detected signals, for generating a first voltage (XE_1) corresponding to the number of light-triggered thyristors to which the forward voltages are applied,

first comparison means (19) connected to said first voltage generating means for comparing said first voltage (XE_1) with a second voltage (KE_1) which corresponds to a state wherein the number of light-triggered thyristors to which the forward voltages are applied is equal to said predetermined number and for generating a first output signal (OUT1) when the number of thyristors to which the forward voltages are applied is not more than the predetermined number,

second comparison means (20) connected to said first voltage generating means for comparing said first voltage (XE_1) with a third voltage (E_1) which corresponds to a state wherein the number of light-triggered thyristors to which the forward voltage is applied is one and for generating a second output signal (OUT2) in the case when the number of thyristors to which the forward voltages are applied is not less than one, and

logical product evaluating means (21) connected to said first and second comparison means and to said light trigger signal generating means for evaluating a logical product of said first and second output signals and for generating a third output signal (OUT3) to activate said light trigger signal generating means.

4,536,817

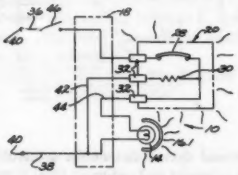
RECESSED LIGHTING FIXTURE AND AN INSULATION DETECTING PROTECTOR DEVICE THEREFOR

Radi Pejouhy, Marshfield, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 10, 1983, Ser. No. 473,848

Int. Cl.³ H02H *5/04*

U.S. Cl. 361—105 **7 Claims**



1. A recessed electrical lighting fixture comprising

lamp means of selected rating,

means adapted to engage a support for mounting the fixture on the support,

means for energizing the lamp means, and

an insulation-detecting thermally responsive protector device comprising

thermally responsive switch means actuatable in response to heating to a selected switch actuation temperature for interrupting energizing of the lamp means, the switch means being thermally associated with the means for mounting the fixture,

and electrical resistance heater means thermally coupled to the switch means for actuating the switch means in a selected period of time if selected thermal insulation conditions should occur around the fixture and block dissipation of heat from the fixture to permit temperature of any portion of the mounting means to be in contact with the support to increase to 90° C., the heater and thermal responsive switch means having electrically conductive lead means extending therefrom to electrically connect the heater and switch means to electrical circuitry for energizing the heater means at a selected voltage and for regulating energizing of the lamp means,

characterized in that

the heater means is proportioned to operate at a power level not greater than about 1 watt and to permit a maximum

outer temperature of not more than 160° C. at a location exposed to said thermal insulation condition during interruption of energizing of said lamp means, the switch means has an actuating means adapted to move at a temperature of 120° C. plus or minus 5° C. for actuating the switch means, and,

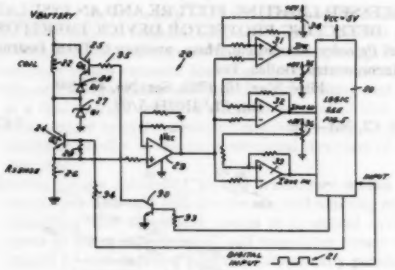
said electrical lead means are provided with selected, relatively low heat-transfer properties and are arranged to limit heat transfer from the heater means away from the heater and switch means through said lead means to a minor proportion of the heat generated by the heater means to assure desired interruption of lamp energizing when said selected thermal insulation conditions occur while avoiding nuisance interruptions of said lamp energizing during variation of said applied heater voltage in the range of about 107 to 127 volts a.c. and during variation in ambient temperature in the range from 12° to 40° C.

4,536,818

SOLENOID DRIVER WITH SWITCHING DURING CURRENT DECAY FROM INITIAL PEAK CURRENT

Arnold D. Nielsen, Wayne, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 2, 1984, Ser. No. 585,715
Int. Cl.³ H01H 47/32
U.S. Cl. 361—154 **6 Claims**



1. A solenoid driver circuit for controlling application of current to a solenoid and reducing total power dissipation, said solenoid driver circuit including:

a first transistor means for completing one series current path through the solenoid;

a second transistor means coupled in series with said first transistor means for providing a current path parallel to the solenoid;

a sense resistor coupled in series with said first transistor means for sensing current in the solenoid;

a Zener diode coupled in parallel with the series combination of said first transistor means and said sense resistor to provide a current path from the solenoid parallel to said sense resistor;

a first comparator means coupled to said sense resistor to compare the sensed current in said sense resistor to a first control current representative of a desired initial peak current in the solenoid;

a second comparator means coupled to said sense resistor to compare the sensed current in said sense resistor to a second control current representative of a desired low sustaining current in the solenoid;

a third comparator means coupled to said sense resistor to compare the sensed current in said sense resistor to a third control current representative of a desired sustaining peak current in the solenoid, said sustaining peak current being larger in magnitude than said low sustaining current and smaller in magnitude than said initial peak current; and

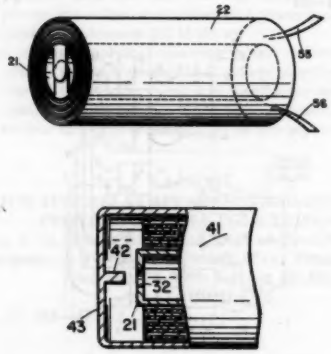
logic means coupled to said first, second and third comparator means so as to receive input signals which are a function of the sense resistor current and the first, second and third control currents, for switching said first and second transistor means on and off as a function of the output of said first, second and third comparator means so that said initial peak current is applied to the solenoid and the current decay from the initial peak current to said sustaining peak current is interrupted by periodic current increases so as to produce an oscillatory function with a decaying average value, said second transistor switching from off to on at the end of an initial solenoid current decay from said initial peak current and said first transistor being off when solenoid current is decaying and on when solenoid current is rising.

4,536,819

CAPACITOR WITH A HEAT SINK CORE

Emory Deutsch, Columbia, S.C., assignor to North American Philips Corporation, New York, N.Y.

Filed Jan. 10, 1983, Ser. No. 456,949
Int. Cl.³ H01G 9/00, 1/08, 7/00
U.S. Cl. 361—274 **4 Claims**



1. A capacitor comprising:

an inner can having an end portion;

a capacitor roll wound upon said inner can;

an outer can having a closed end;

said inner can and said capacitor roll received within said outer can, the end portion of said inner can being adjacent the closed end of said outer can; and

fastening means for fastening said inner can in good heat conducting relationship to said outer can.

4,536,820

ELECTRICAL FEEDTHROUGH MEANS FOR PRESSURE TRANSDUCER

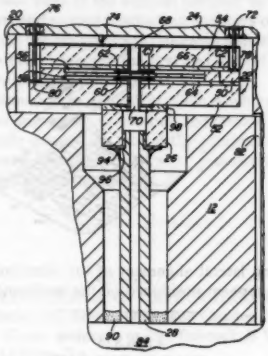
Paul B. Binder, North Wales, and Paul M. Kroninger, Jr., Harleysville, both of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed Mar. 29, 1984, Ser. No. 594,585
Int. Cl.³ H01G 7/00
U.S. Cl. 361—283 **5 Claims**

4. An electrical connecting means for connecting a pressure transducer to an associated circuit through a bulkhead welded in the pressure receiving body of the assembly containing said transducer, comprising:

a rod mounted in a hole in said bulkhead to conduct electrical current therethrough, said rod being sealed to the periphery of said hole to form a pressure seal;

a hole formed in the end of said rod facing said transducer; and



a spring loaded plunger type contact inserted in said hole so that its contact protrudes to connect to said transducer upon assembly of the feedthrough and transducer.

4,536,821

CERAMIC CAPACITORS AND DIELECTRIC COMPOSITIONS

Jennifer M. Wheeler, Loughton, and Dawn A. Jackson, Old Harlow, both of England, assignors to Standard Telephones and Cables, plc, London, England

Filed Feb. 28, 1984, Ser. No. 584,343

Claims priority, application United Kingdom, Mar. 10, 1983, 8306659

Int. Cl.³ H01G *4/10, 7/00;* H01B *3/12*

U.S. Cl. 361—321 **22 Claims**

15. A multilayer ceramic capacitor including a plurality of layers of dielectric and a plurality of high silver content electrodes arranged between the dielectric layers, which dielectric layers consist essentially of non-stoichiometric lead magnesium niobate and of lead zinc niobate.

4,536,822

ELECTRIC CIRCUIT INTERRUPTER AND ASSOCIATED MOUNTING

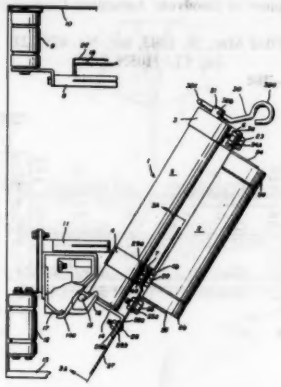
Anthony Osborne, Duluth, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Continuation of Ser. No. 603,623, Apr. 25, 1984, abandoned. This application Mar. 1, 1985, Ser. No. 706,911

Int. Cl.³ H02B *1/18*

U.S. Cl. 361—340 **7 Claims**

1. An electric circuit interrupter and associated mounting comprising an elongated support element of insulating material pivotally mounted about a fixed pivot, a pair of movable contacts mounted on said elongated support element in spaced relation to each other and arranged to engage and to disengage a pair of fixedly mounted contacts respectively, a circuit interrupter mounted on and movable with said elongated support element and having a pair of spaced apart terminals one of which is directly connected with one of said movable contacts and wherein the improvement includes an elongated specially constructed bus of conducting material disposed in generally parallel relation to said elongated support element and electrically connected with the other of said movable contacts and having a plurality of points of connection each including an aperture, said points of connection being spaced along the length of the bus for selectively cooperating with the other terminal of said circuit interrupter whereby circuit interrupters



of different electrical ratings and physical dimensions may be mounted on said elongated support element.

4,536,823

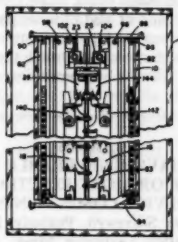
ELECTRIC PANEL BOARD HAVING AN IMPROVED EXTRUDED BASE PAN CONFIGURATION

Wayne A. Ingram, Stone Mountain; Stephen L. Johnson, Cumming, and Thomas E. Coleman, Decatur, all of Ga., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Oct. 27, 1981, Ser. No. 315,565

Int. Cl.³ H02B *1/04*

U.S. Cl. 361—355 **12 Claims**



1. An insulative base pan for a circuit breaker panelboard comprising:

a centrally disposed rail extending the length of said pan, said rail having an inverted-T opening throughout the length thereof, said rail including a pair of outer lips extending the length thereof for slidably engaging respective bus bars;

a first pair of channels extending the length of said base pan, each channel being disposed in a parallel relationship on either side of said rail for slidably receiving a pair of main-line lugs; and

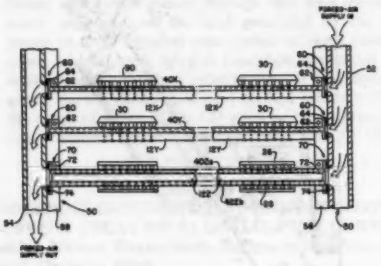
a second pair of channels extending the length of said base pan, each channel being disposed parallel to said rail and along the outer edge of said base pan for slidably receiving elongated neutral elements thereon.

4,536,824

INDIRECT COOLING OF ELECTRONIC CIRCUITS

Howard W. Barrett, and Paul F. Fledderjohann, both of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Mar. 28, 1983, Ser. No. 479,222
Int. Cl.³ H05N 7/20
U.S. Cl. 361—384 **4 Claims**



1. Apparatus for indirect cooling of electronic IC components comprising in combinaton:

a printed circuit board;

a plurality of IC components mounted to the printed circuit board by lead wires connected into said board, said IC components oriented in a plurality of parallel rows on the printed circuit board;

a source of forced air;

a plate positioned between the printed circuit board and the IC components, said plate comprising a low thermal resistance, high heat conduction material defining parallel channel passages between the rows of IC components and in intimate contact beneath the IC components to provide conduction heat transfer from the ICs during operation; and

means mounted at each end of the printed circuit board to hold the board in a predetermined orientation and defining an input channel passage at one end of the board and an output channel passage at the opposite end thereof, the input channel passage being connected to the source of forced air and each of said channel passages being interconnected between the input and output channel passages such that forced air passing through the passages provides increased heat transfer by convection within the channel passages.

4,536,825

LEADFRAME HAVING SEVERABLE FINGERS FOR ALIGNING ONE OR MORE ELECTRONIC CIRCUIT DEVICE COMPONENTS

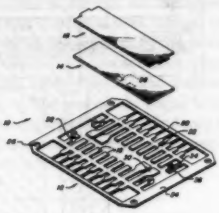
Herman F. van Dyk Soerewyn, Peabody, Mass., assignor to Unitrode Corporation, Lexington, Mass.

Filed Mar. 29, 1984, Ser. No. 594,745
Int. Cl.³ H05K 7/20
U.S. Cl. 361—386 **9 Claims**

1. Leadframe apparatus selectively aligning an electronic circuit device component having four corners positioned on the leadframe apparatus, comprising:

four elongated fingers having free ends that are each integrally formed in spaced-apart relation on, and individually severable from, the leadframe apparatus at points remote from their free ends and individually proximate a corresponding corner of the electronic circuit device component positioned on the leadframe apparatus; and

two upstanding positioning tabs integrally formed with each of said elongated and severable fingers at a point thereon proximate the corresponding free end thereof and individually abutting the corresponding confronting corner surface of the electronic circuit device component positioned on the leadframe apparatus with one of said tabs providing longitudinal alignment of and with the other of said tabs



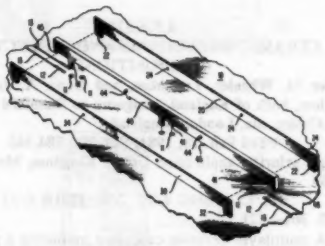
providing lateral alignment of the electronic circuit device component positioned on the leadframe apparatus.

4,536,826

SNAP-IN BUS BAR

Serhat M. Ahiskali, Randolph, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 10, 1984, Ser. No. 649,197
Int. Cl.³ H01R 9/03; H02G 5/00
U.S. Cl. 361—407 **15 Claims**



1. In combination:

a circuit board,

a bus bar assembly mounted on the circuit board comprising:

a support member having electrical insulation properties, and first and second conducting members affixed to opposite sides of the support member respectively,

the circuit board including receptacle means and the support member including connecting members for engaging the receptacle means and mechanically affixing the support member to the circuit board, and

the first and second conducting members each including conducting connecting means for coupling the first and second conducting members to conducting paths in the circuit board.

2. The combination as defined in claim 1 wherein the support member further includes a plurality of support elements for maintaining the support member at a fixed distance above a surface of the circuit board.

3. The combination as defined in claim 2 wherein the connecting members comprise a plurality of fingers extending from the support member in register with the receptacle means which comprise holes in the circuit board, the fingers having securing means which comprise a catch means on its free end with a flat catch surface perpendicular to the finger to catch an underside of the circuit board and secure the support member to the circuit board and cylindrical surface ramp means below the flat catch surface to facilitate entry of the finger into the holes in the circuit board.

4. The combination as defined in claim 3 wherein the support member includes a plurality of pins extending from both sides of the support member and the first and second conducting

members include a plurality of pin holes in register with the pins and the first and second conducting members being secured to opposite sides of the support member by placing pin holes of the first and second conducting members over the pins so they penetrate the pin holes and flattening a shank end of the pins to form a head to secure the first and second conducting members to the support member.

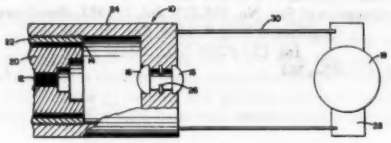
5. The combination as defined in claim 4 wherein the conducting connecting means of the first and second conducting members include conducting tabs at their respective ends and the circuit board includes precut slots connected to printed circuit paths for accepting the tabs.

4,536,827

IMAGE COLLECTION AND OBJECT ILLUMINATION

John W. Berthold, III, Salem, Ohio, and Charles S. Fitzgerald, Brookfield, Conn., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 30, 1984, Ser. No. 575,259
Int. Cl.³ F21V 7/04
U.S. Cl. 362—32 **17 Claims**



1. A device for remotely inspecting the inner surface of a tubular object comprising means for transmitting a beam of light into the tubular object, a target to reflect said light beam onto the inner surface of the tubular object producing a circumferential band of illumination on the inner surface of the tubular object, and annular means for intercepting the light emanating from said circumferential illumination band to provide a remote display of the inner surface of the tubular object.

4,536,828

LIGHTING DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 275,782, Jun. 22, 1981, abandoned. This application Feb. 2, 1984, Ser. No. 576,765
Claims priority, application Japan, Jun. 27, 1980, 55-87280
Int. Cl.³ F21V 7/04
U.S. Cl. 362—32 **8 Claims**

1. A room illuminating device for diffusing beams of light rays propagating through and emitting from an optical wave guide, which comprises:

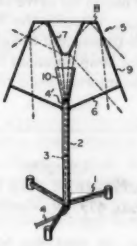
a base,

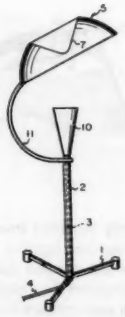
a support mounted on said base and having an elongated cavity for receiving therein at least one optical wave guide, said cavity being open at least at the top to ensure that the light rays can be emitted upwardly,

a light ray transmitting optical wave guide passing through said cavity,

a frusto conical hood affixed over said open top of said elongated cavity,

means for reflecting the light rays issuing from the optical wave guide, said means including, (a) a substantially conical central convex portion projecting downwardly, (b) a partially cut away disc shaped flat portion continuous to said central portion conformed so that a majority of those light rays which are directed upwardly by said central portion are thrown toward the ceiling, and (c) a generally conical downwardly slanted peripheral portion, and





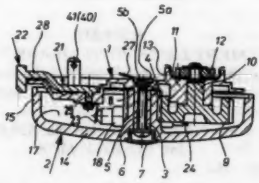
means for connecting said reflecting means to said support in such a manner that said central convex portion faces the top end of said support.

4,536,829

HAND ACTUATING ELEMENT FOR ADJUSTMENT DRIVES ON AUTOMOBILES

Rainer Grimm, Wetzlar, and Adolf Elfen, Bingen-Bingerbrück, both of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H. and Franz Kirsten Electrotechnische Spezialfabrik, both of, Fed. Rep. of Germany

Filed Dec. 15, 1983, Ser. No. 561,857
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1982, 3246985
Int. Cl.³ B60Q 3/02
U.S. Cl. 362—74 **16 Claims**



1. Rotatable hand actuating element for adjustment drives in automobiles, especially handwheel assembly for the actuation of sliding roofs, consisting of a shell-like handwheel equipped with a peripheral rim and an internally mounted, central bearing sleeve and of a mounting plate, towards which the open side of the handwheel faces and which rotatable journals the handwheel by means of a bearing journal extending into the

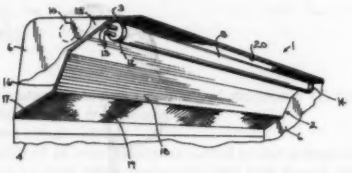
bearing sleeve, an external set of teeth on the bearing sleeve being in engagement with a gearwheel rotatably mounted on the mounting plate, which is connected in rotationally locked manner with a drive pinion for drive elements transmitting the adjustment movement, wherein the handwheel possesses at least one wall surface translucent to light, opposite to which at least one incandescent lamp mounted between handwheel and mounting plate in the internal space of the handwheel is situated.

4,536,830

REFLECTOR ASSEMBLY FOR LAMP FIXTURES

Gregory G. Wisniewski, 4737 N. Marlborough Ave., Whitefish Bay, Wis. 53211

Filed Jul. 26, 1984, Ser. No. 634,596
Int. Cl.³ F21S *3/00*
U.S. Cl. 362—223 **11 Claims**



1. A releasably mounted insert for interconnection with a multi-lamp fluorescent lighting fixture having a top wall and oppositely disposed end and side walls enclosed by a diffuser plate, and an elongated fluorescent source lamp secured in said fixture between said end walls, said insert replacing a second fluorescent lamp from said fixture and comprising:

a reflector member dimensioned to have a length substantially corresponding to the length of a side wall of a fixture and a width sufficient to extend between a top and side wall of a fixture, said reflector member including a first portion extending downwardly from said top wall and a second portion extending between said first portion and said side wall, said first portion disposed at an acute angle with respect to said top wall, and said first and second portions disposed at an obtuse angle with respect to one another; and

attaching means for releasably attaching said reflector member to said fixture to reflect the illumination provided by the fluorescent source lamp so that the illumination provided by the source lamp is substantially equivalent to the illumination provided by the source lamp and the removed second lamp.

4,536,831

REPLACEMENT LAMP WITH MEANS FOR SPACING

George English, Reading, and Stephen J. Leadvaro, Salem, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

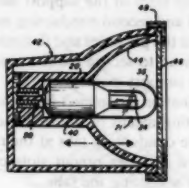
Filed Jul. 9, 1984, Ser. No. 629,133
Int. Cl.³ F21V *15/00*
U.S. Cl. 362—263 **18 Claims**

1. A lamp member adapted for use in a lighting unit having a light-transmitting cover, said lamp member comprising:

a base shell member;

a tungsten-halogen capsule having a wedge base portion secured to said base shell member, said capsule including a first envelope with an inert gas fill and halogen disposed therein, a filament structure axially located within said first envelope and supported by said wedge base portion; and

spacer means for maintaining said first envelope and said light-transmitting cover in a spaced-apart relationship,



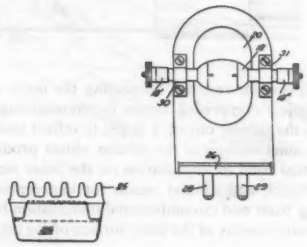
said spacer means in operative contact with said cover and located between said first envelope and said cover.

4,536,832

REPLACEABLE LIGHT SOURCE ASSEMBLY

Thomas M. Lemons, Marblehead, Mass., assignor to Altman Stage Lighting Co., Inc., Yonkers, N.Y.

Continuation of Ser. No. 394,277, Jul. 1, 1982, abandoned. This application May 9, 1984, Ser. No. 608,390
Int. Cl.³ F21P *5/02*; F21M *7/00*
U.S. Cl. 362—264 **1 Claim**

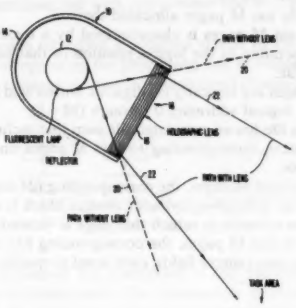


1. A replaceable light source assembly for a spotlight having a housing, lens and lamp socket comprising a quartz envelope with reduced diameter tubular portions protruding from opposite ends thereof, said envelope having two arc electrodes therein comprising an arc light source, said tubular portions containing electrical leads of a length greater than the tubular portions, said leads extending away from the arc electrodes and sealed within said tubular portions, said electrical leads having connection portions extending exterior to the envelope, a heat sink structure having an L-shaped base portion provided with mounting means for engaging an existing lamp socket and a body extending vertically therefrom with a rear face and a front face, a plurality of heat radiating fins on the rear face, a substantially flat continuous mirror affixed to said front face of said heat sink structure, clamps fastening said quartz envelope to said heat sink structure on the front face in front of the mirror so that the light source is spaced from the mirror substantially the length of the source, said clamps engaging the tubular portions of the quartz envelope so as to create a heat conductive path and dissipate heat from the tubular portions, said mirror having a vertical length longer than the horizontal length to define an elongated shape the vertical length being transverse to the axis between the arc electrodes, said source being positioned by said clamps midway of the vertical length of the mirror and being imaged in said mirror to produce an effect of at least two sources, said elongated mirror producing substantially a circular beam.

4,536,833
LIGHTING FIXTURE UTILIZING A MULTI-LAYERED HOLOGRAM AS A LENS ELEMENT

Charles S. Davis, New York, N.Y., assignor to Knoll International, Inc., New York, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,469
Int. Cl.[3] F21V 9/00
U.S. Cl. 362—293 3 Claims

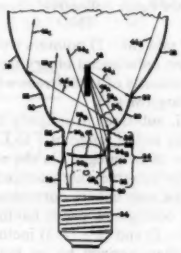


1. A lighting fixture comprising a spatially fixed light source, and a multi-layered holographic lens element receiving light from said source and directing said light to a task area, the layers of said lens element being responsive to light of one or more wavelengths of interest and varying angles of incident radiation to diffract light from said source toward said task area.

4,536,834
R LAMP HAVING AN IMPROVED NECK SECTION FOR INCREASING THE USEFUL LIGHT OUTPUT

Robert W. Sands, Hudson, and Daniel M. Bloom, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 22, 1984, Ser. No. 612,778
Int. Cl.[3] F21V 7/09
U.S. Cl. 362—303 13 Claims



1. A reflector lamp comprising an electrically conductive base, a concave reflector, and a finite light source having its geometric center located approximately at the focal point of the concave reflector and rigidly affixed to an electrically insulative stem;

said concave reflector comprising:

(a) a primary reflective section having a parabolic shape and a focal point;

(b) one or more intermediate reflective section each having a parabolic shape substantially confocal with said primary reflective section and each respectively joined by one or more transitional sections and;

(c) a neck section effective in advantageously reflecting light rays impinging onto its surface back into the useful beam pattern of the reflector lamp and comprising;

(c_i) a reducing section;

(c_{ii}) a first substantially straight cylindrical section;

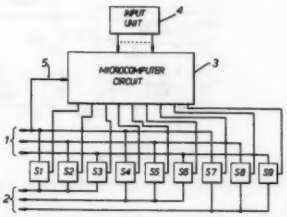
(c_{iii}) an expanding section, and;

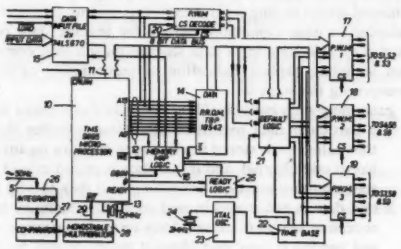
(c_{iiii}) a second substantially straight cylindrical section for mating with the electrically conductive base.

4,536,835
DIRECT A.C. TO A.C. CONVERTER CONTROLLED BY A DATA PROCESSOR

Peter J. Andrews, Northants, United Kingdom, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 7, 1983, Ser. No. 456,211
Claims priority, application United Kingdom, Jan. 13, 1982, 8200897
Int. Cl.[3] H02M 5/293
U.S. Cl. 363—163 20 Claims





1. A direct A.C. to A.C. supply Converter having: input conductors for a balanced polyphase A.C. input supply system; output conductors for an A.C. supply system;

a plurality of bidirectional switches for individually connecting each input conductor to each output conductor; and a control means connected to operate the switches, said control means including: a data processor means programmed to produce numerical value signals representing widths of width modulated pulses; circuit means for deriving timing signals from the input supply system and applying them to the data processor means for determining the timing of said width modulated pulses; and pulse generator means for receiving and responding to said numerical value signals to operate said switches by generating a repeating sequence of abutting pulses width modulated according to said numerical values and having durations shorter than the periods of the A.C. input and output supply systems; said data processor means applying said numerical value signals to said pulse generator means so that (1) for each output conductor the switches connected to that output conductor are rendered conducting in a repeating sequence by and for the durations of the width modulated pulses applied thereto; (2) each phase of the input supply system is connected in turn to each output phase of the output system; and (3) at any instant only one

of said switches connected to each of the output conductors is conductive.

4,536,836

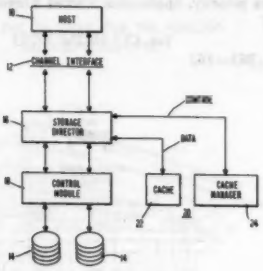
DETECTION OF SEQUENTIAL DATA STREAM

P. David Dodd; Ronald L. Blickenstaff, both of Boulder, Colo.; Richard L. Coulson, Stanford, Calif.; Robert J. Moreno, Boulder, and Brian E. Trede, Lafayette, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Continuation-in-part of Ser. No. 325,350, Nov. 27, 1981, Pat. No. 4,468,730. This application Nov. 15, 1982, Ser. No. 441,901

Int. Cl.³ G06F *9/00*

U.S. Cl. 364—200 **11 Claims**



1. Method for improving efficiency of a data processing system of the type comprising a host computer connected via channel means to long-term data storage means, said host being adapted to issue commands calling for specific data records stored on said long-term data storage means, said commands not including explicit indication of sequentiality of requets, comprising the steps of:

examining such individual host originated command seeking a particular data record to determine whether the data thus called for is stored in solid-state memory means external to said channel, and if said data is stored in said solid-state memory means, transmitting said data to said host;

if said data is not stored in said solid-state memory means, accessing said data on said long-term data storage means and passing it over said channel means to said host, and examining the commands by which a given record is passed from said long-term data storage means to said host in order to determine whether said record is one of a sequence of such records; and

if said determination indicates that said record is one of such a sequence, reading the next record in said sequence from said long-term storage means into said solid-state memory means in anticipation of its being called for by said host;

wherein the indication that a given record is one of a sequence is derived by examination of said commands for indicators signaling that said data is not part of such a sequence, in response to absence of such indicators.

4,536,837

IMPROVED DISK FILE ALLOCATION AND MAPPING SYSTEM UTILIZING CYLINDER CONTROL BLOCKS AND FILE MAP HAVING UNBALANCED TREE STRUCTURE

Robert A. Olson, Los Altos, and Patrick D. Ross, Sunnyvale, both of Calif., assignors to Elxsi, San Jose, Calif.

Filed May 25, 1982, Ser. No. 381,991

Int. Cl.³ G06F *7/00, 13/04*

U.S. Cl. 364—200 **11 Claims**

1. A data processing system having a disk subsystem that includes at least one disk drive for mass storage wherein:

the disk subsystem defines a disk space that consists of a plurality of cylinders, each of which includes a plurality of disk pages;

each of said cylinders has an associated cylinder control block;

each disk page in said disk space is characterized by a physical disk address corresponding to the location of that page in said disk space;

information stored in said disk space is organized on the basis of at least one file;

a given file has M pages allocated thereto;

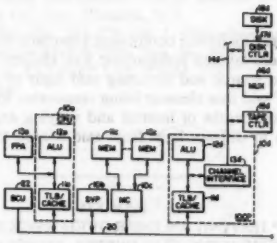
each of said M pages is characterized by a logical address corresponding to the logical position of that page in said given file;

said M pages are logically contiguous within said given file, having logical addresses 0 through (M−1);

said given file has an associated file map that includes M file map entries corresponding to said M pages on a one-to-one basis;

for each of said M pages, the corresponding file map entry is located in whichever cylinder control block is associated with the cylinder in which that page is located;

for each of said M pages, the corresponding file map entry contains two pointer fields, each sized to specify a pointer



representative of the physical address of a page in said disk space, thereby defining a set of 2M pointer fields;

of said M pages, for each page having a logical address greater than 0, a pointer representative of the physical address of that page is contained in one of the pointer fields of the file map entry corresponding to another of said M pages having a lower logical address, whereupon said 2M pointer fields collectively contain a set of (M−1) pointers; and

the locations of said (M−1) pointers within said 2M pointer fields define an unbalanced binary tree structure wherein said file map consists of L sub-trees where L is the integer portion of $\log_2(M+1)$,

each of said L sub-trees is uniquely characterized by an integer index in the range of 1 to L inclusive,

for each value of an integer i in the range of 1 to (L−1) inclusive, the sub-tree characterized by an index equal to i has 2^i file map entries corresponding to a subset of 2^i logically contiguous pages having logical addresses between (2^i-2) and $(2^{i+1}-3)$ inclusive, and

the sub-tree characterized by an index equal to L has $(M-2^L+2)$ file map entries corresponding to a subset of $(M-2^L+2)$ logically contiguous pages having logical addresses between (2^L-2) and (M−1) inclusive.

4,536,838

MULTI-PROCESSOR SYSTEM WITH COMMUNICATION CONTROLLER USING POLL FLAGS FOR NON-CONTENTIOUS SLOT RESERVATION

Gerhard Ringel, and Gabor Fencsik, both of Berkeley, Calif., assignors to MDS Qantel, Inc., Hayward, Calif.

Filed Mar. 24, 1983, Ser. No. 478,604

Int. Cl.³ G06F *3/04, 15/16*

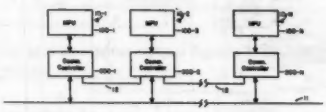
U.S. Cl. 364—200 **4 Claims**

1. In a multiple data processing station system wherein mes-

sages are exchanged among the stations over a communication channel in sequential time slots, wherein the stations contend with one another for use of the channel, and wherein each such message includes fields identifying the addresses fo the sending station and of the receiving station and a poll flag, each such station having an improved communication controller which comprises:

a processing unit, a memory means and a channel interface unit interconnected with one another and with said channel;

control means including a program stored in the memory means for operating the processing unit in response to the end of a message to issue to its associated channel interface



unit a command for contention of the channel (a) only after a predetermined slot reservation interval if such message is either addressed to another station or though addressed to the associated station has a non-asserted poll flag and (b) immediately if such message is addressed to the associated data processing station and has its poll flag asserted, whereby a station to which an inbound message is addressed with an asserted poll flag will be the sole contender for and winner of control of the channel for the next succeeding time slot; and

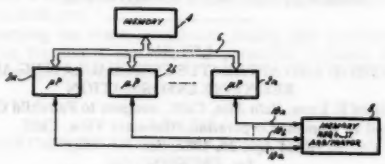
said channel interface unit being operable to transmit and receive such messages and to contend for the channel in response to said commands.

4,536,839

MEMORY REQUEST ARBITRATOR

Hemen V. Shah, Carritos; Victor Mashikian, Santa Ana; John Seaton, San Jose, and Gordon Keller, Danville, all of Calif., assignors to MAI Basic Four, Inc., Tustin, Calif.

Filed Mar. 30, 1982, Ser. No. 363,589
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **4 Claims**



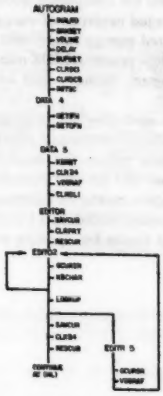
1. In a system comprising a plurality of requestors for making simultaneous access requests to a common memory, a memory request arbitrator comprising: means for receiving a plurality of simultaneous access requests; means for generating a signal to assign relative priorities to each of such requests; means for selecting the request with the highest priority level; means cooperating with said means for selecting for overriding said priority selection in response to super priority requests; and, means for changing the relative priority of each requestor, said means for changing being responsive to a periodically generated signal to rotate the highest priority so that each requestor is assigned the highest priority over a given period of time.

4,536,840

AUTOGRAMMER

Ronald Borta, 252 Henry La., Barrington, Ill. 60010

Filed Sep. 30, 1982, Ser. No. 432,135
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—300 **17 Claims**



1. A method of generating program for manipulating data on a computer comprising:

using field delimiters inputted by a user through an input-output unit connected to a computer to delineate a field;

using a program code of said computer to create a data base descriptor file, said descriptor file adapted to receive and store said delimiter;

using said program code to create a data base file in a separate location, said data base file adapted to receive and store inputted data;

using said program code to create a data base key file in a separate location, said key file adapted to identify said stored data; and

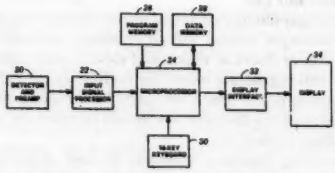
using said program code to manipulate and transfer data between said field, said data base descriptor file, said data base file and said data base key file to generate an application program.

4,536,841

PORTABLE NEUTRON SPECTROMETER AND DOSIMETER

David A. Waechter; Bruce H. Erkkila, and Dennis G. Vasilik, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 8, 1983, Ser. No. 464,841
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—414 **3 Claims**



1. A portable neutron spectrometer and dosimeter apparatus comprising:

detector means including a Linear Energy Transfer proportional counter for detecting neutrons within a preselected

energy range, said detector means further including means for generating pulses in accordance with energy levels of received neutrons and pulse height analyzer means for counting said generated pulses and for producing a spectral representation as an output thereof;

microprocessor means for receiving the output of said detector means and for computing accumulated dose and dose rate for detected neutrons of various energy levels within the preselected energy range, said microprocessor means including a low power CMOS microprocessor, an 8k byte CMOS program memory and an 8k byte CMOS data memory;

display means including an approximately 80 by 28 dot matrix liquid crystal display operably connected to said microprocessor means for displaying said accumulated dose and dose rate for said detected neutrons; and

internal calibration means for calibrating said apparatus, said calibration means including a Cm244 alpha source behind a shutter and means for opening and closing said shutter.

4,536,842

SYSTEM FOR MEASURING INTERFLOOR TRAFFIC FOR GROUP CONTROL OF ELEVATOR CARS

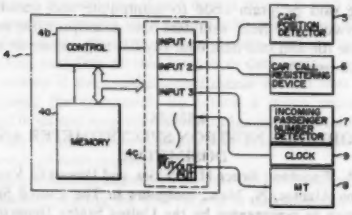
Kiyoshi Yoneda; Hiroshi Takeuchi, both of Tokyo; Tetsuo Yamatani, Yokkaichi; Toyoto Hijiya, Yokosuka; Hideo Takeda, Inagi; Koji Shibuya, Ashiya, and Kiichiro Tanaka, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 29, 1983, Ser. No. 479,899

Claims priority, application Japan, Mar. 31, 1982, 57-53469; Mar. 31, 1982, 57-53471; Jun. 25, 1982, 57-109529

Int. Cl.³ G06F *15/46*; B66B *1/18*

U.S. Cl. 364—424 **11 Claims**



3. A system for recording interfloor traffic of passengers utilizing an elevator car comprising:

position detecting means for detecting a position of said elevator car;

passenger number detecting means for detecting an outgoing passenger number and an incoming passenger number at each of floors at which said elevator car stops;

car call registering means for registering car calls for destination floors which are made by incoming passengers at each of the floors at which said elevator car stops;

a clock device; and

recording means, responsive to said position detecting means, said car call registering means, said passenger number detecting means, and said clock device, for measuring the interfloor traffic of passengers and for recording the measured interfloor traffic for each of origin-destination floor pairs and for each of predetermined time conditions.

4,536,843

TOTAL ENERGY BASED FLIGHT CONTROL SYSTEM

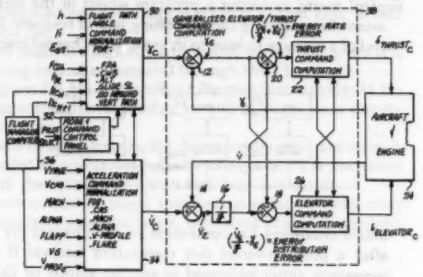
Antonius A. Lambregts, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US82/01388, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO84/01345, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 30, 1982, Ser. No. 454,205

Int. Cl.³ B64C *13/00*

U.S. Cl. 364—434 **52 Claims**



1. An aircraft longitudinal flight control system for automatically controlling the aircraft's flight path and speed, using engine thrust and elevator control surface position, comprising:

means for developing an incremental net thrust command signal ΔT_c which is a linear combination of a signal representative of the aircraft's total energy error with respect to the flight path and speed command targets and a signal representative of the rate of change of the aircraft's total energy;

thrust control means for automatically controlling the incremental net thrust of the engines to said incremental net thrust command signal ΔT_c, such that said total energy error is reduced to zero;

means for developing an incremental elevator position command $\Delta\delta_{ec}$ for controlling the deviation of the aircraft from a commanded flight path; and

elevator position control means for automatically positioning the elevator to said incremental elevator command signal $\Delta\delta_{ec}$ such that said deviation of the aircraft from the commanded flight path is reduced to zero.

4,536,844

METHOD AND APPARATUS FOR SIMULATING AURAL RESPONSE INFORMATION

Richard F. Lyon, Palo Alto, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 26, 1983, Ser. No. 488,886

Int. Cl.³ A61N *1/36*

U.S. Cl. 364—487 **19 Claims**

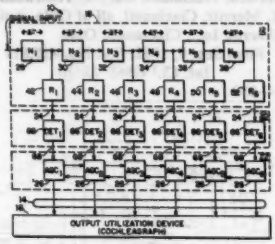
1. A method for simulating neural response of an ear comprising:

filtering an input signal representative of sound stimuli through a first filtering means, said first filtering means producing first response characteristics to said stimuli, said first response characteristics being divided into a plurality of channels as channelized frequency band limited signals; thereafter

half-wave detecting each one of said channelized frequency band limited signals representative of said first response characteristics over a relatively broad band to produce a plurality of frequency channelized detected signals;

compressing said frequency channelized detected signals in each said channel as a function of amplitude of frequency

channelized detected signals in other channels to produce output electronic signals; and



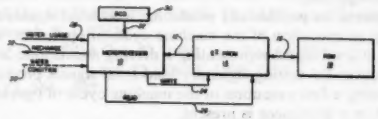
providing said electronic output signals to an output utilization means.

4,536,845

SELF-PROGRAMMABLE CONTROLLER FOR WATER CONDITIONER RECHARGING

Donald P. DeVale, Sycamore, and Stanley F. Rak, Mundelein, both of Ill., assignors to Culligan International Company, Northbrook, Ill.

Filed Aug. 31, 1983, Ser. No. 528,242
Int. Cl.³ G06F *15/46*; B01D *21/24*
U.S. Cl. 364—500 **19 Claims**



1. A process for controlling the recharging of a water conditioner, which comprises the steps of:

sensing if water is being used during selected fractions of a predetermined period of time;

storing information signifying water usage during said selected fractions;

automatically determining a time fraction, based on the stored information, when water is unlikely to be used;

sensing a selected parameter to determine if recharging is required; and

recharging the water conditioner during said determined time fraction if said selected parameter indicates that recharging is required.

4,536,846

DISTORTION REDUCER FOR COMPANDED ANALOG SYSTEMS

Dipankar Raychaudhuri, Kendall Park, and Leonard N. Schiff, Lawrenceville, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 20, 1982, Ser. No. 420,506
Int. Cl.³ H04B *1/64*
U.S. Cl. 364—514 **5 Claims**

1. In an analog communication system comprising a transmitter, a transmission path of bandwidth B_2, and a receiver, a method of recovering components of a signal m(t) of bandwidth B_1 which are cutoff in the transmission of such signal over said transmission path, where $B_2 \geqq B_1$, and comprising the steps of:

compressing the signal at the transmitter;

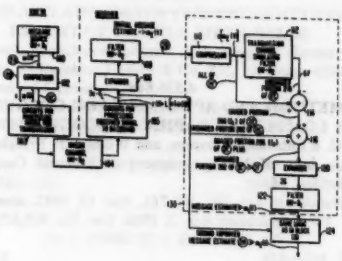
transmitting the signal over said transmission path;

demodulating the transmitted signal at the receiver to produce a signal r(t);

expanding and filtering the signal r(t) to produce an initial reconstructed signal $m_E(t)$;

compressing said signal $m_E(t)$ to produce a signal $C[m_E(t)]$ with frequency components f_c extending above the frequency bandwidth B_2;

filtering said signal $C[m_E(t)]$ through a filter of bandwidth



B_2 to produce a signal S_F corresponding to $C[m_E(t)]$ but with the frequency components f_c extending above B_2 being cutoff;

subtracting S_F from $C[m_E(t)]$ to produce the frequency components f_c; and

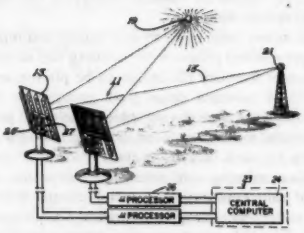
adding frequency components f_c to r(t) to produce a first order of correction of the received signal r(t).

4,536,847

HELIOSTAT CONTROL EMPLOYING DIRECT CURRENT MOTOR

Mark R. Erickson, Northglenn, and James A. Kaehler, Littleton, both of Colo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 30, 1982, Ser. No. 454,590
Int. Cl.³ G06F *15/46*; G05D *1/12*; F24J *3/02*
U.S. Cl. 364—516 **8 Claims**



8. In a method of positioning the body so so as to achieve a particular orientation by movement about two axes, the improvement comprising:

a. calculating a commanded position for the body to be at a particular time of day in terms of numbers of counts for respective Hall Effect Devices connected with respective direct current electric motors serving as the respective elevation and azimuth motors;

b. initializing and powering up at a predetermined position and monitoring the position by counting means thereafter;

c. accumulating the number of steps in azimuth and elevation by respective Hall Effect Devices on said motors to get to said commanded position from said predetermined position each time said body is to be moved; energizing respective said azimuth and elevation direct current motors where any movement in azimuth and elevation are desired; counting the number of signals from respective said Hall Effect Devices connected with respective said

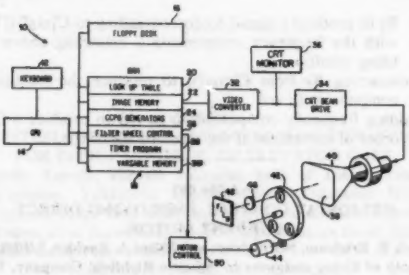
azimuth and elevation motors and comparing number of positions moved with the numbers to be moved to achieve respective commanded positions and doing this repetitively throughout the chronology of a day.

4,536,848

METHOD AND APPARATUS FOR COLORED COMPUTER GRAPHIC PHOTOGRAPHY

Alice M. d'Entremont, Boston, and William T. Freeman, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 368,711, Apr. 15, 1982, abandoned.
This application Apr. 2, 1984, Ser. No. 595,675
Int. Cl.³ G09G *1/28*; H04N *1/46*
U.S. Cl. 364—526 **13 Claims**



7. A system for defining and displaying an image for photographic reproduction comprising:

video display means for visually displaying the image to be photographed; and

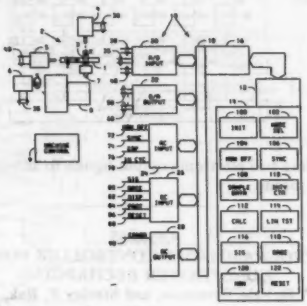
computer means responsive to user controlled input signals and a preselected program for defining and storing within a computer memory the image to be photographed as a plurality of constant color pixel groups; for thereafter determining the time during which a selected photosensitive material must be exposed to a selected light color and intensity for each of said constant color pixel groups; for thereafter ordering said determined exposure times for each of said constant color pixel groups into either a progressively increasing or decreasing sequence; and for finally providing a video image signal to said video display means in order to display at said selected light color and intensity each of said constant color pixel groups for its said determined exposure time to the photosensitive material, said computer means starting said video image signal either with the first of said constant color pixel groups in said ordered sequence and thereafter adding succeeding constant color pixel groups in said ordered sequence to said video image signal so as to finally simultaneously include in said video image signal all of said constant color pixel groups in said ordered sequence when said ordered sequence comprises progressively decreasing exposure times or, alternatively, with all of said constant color pixel groups in said ordered sequence and thereafter eliminating from said video image signal succeeding constant color pixel groups in said ordered sequence so as to finally include in said video image signal only the last of said constant color pixel groups in said ordered sequence when said ordered sequence comprises progressively increasing exposure times.

4,536,849

MACHINE OPERATION MONITOR

Donald J. Borisch, Cincinnati; Gary V. Hanrahan, Mason, and Herbert E. Merritt, Cincinnati, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sep. 8, 1982, Ser. No. 415,811
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—550 **10 Claims**



1. Apparatus for detecting a malfunction during an execution of a machine cycle of operation, the machine having at least one movable member driven by driving means for effecting relative motion between a workpiece and a tool, the apparatus comprising:

(a) means for periodically producing load level signals during an execution of the machine cycle of operation, each load level signal representing a driving means load level;

(b) means for storing signature load level signals produced during a first execution of the machine cycle of operation when a workpiece is present;

(c) means for storing base load level signals produced during a second execution of the machine cycle of operation when a workpiece is not present;

(d) means responsive to the signature load level signals and the base load level signals for producing limit signals, each limit signal representing a load level defining an acceptable maximum driving means load for a predetermined interval occuring during an execution of the machine cycle of operation;

(e) means for comparing load level signals produced during subsequent executions of the machine cycle of operation to the limit signals; and

(f) means responsive to the comparing means for producing an error output signal when a load level signal exceeds a limit signal.

4,536,850

MONITORING THE STATUS OF THE TRIP CYCLE IN AN ELECTRONIC POSTAGE METER

Edward C. Duwel, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,915
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—550 **26 Claims**

1. A method for monitoring the trip status of the trip cycle in an electronic postage meter, comprising the steps of:

reading the state of a bistable member having at Home and In Cycle states;

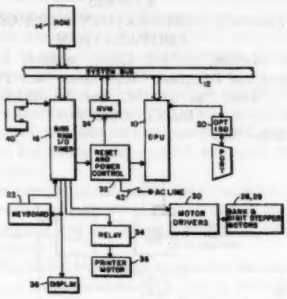
setting a plurality of bits if the bistable member is Home;

re-reading the state of the bistable member after a predetermined period of time has elapsed;

storing a fatal error bit if the bistable member is in the Home state after the re-reading and attempting to complete the trip cycle;

further re-reading the state of the bistable member after a

predetermined period of time has elapsed if the re-reading of the state of the bistable member dislcoses that the bistable member is In Cycle;



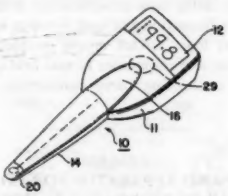
resetting certain of the set bits if the further reading of the bistable member discloses that it is Home; and ending the trip cycle.

4,536,851

ELECTRONIC THERMOMETER AND ASSOCIATED APPARATUS

Damon Germanton, 7 Alberta Dr., Kinnelon, N.J. 07405; Charles Germanton, 38 Mountain Ave., Summit, N.J. 07901, and Donald Weiss, 200 Cliffside Park, Winston Towers, Englewood, N.J. 07631

Filed Oct. 22, 1982, Ser. No. 436,022
Int. Cl.³ G01K *1/08, 7/20*
U.S. Cl. 364—557 **20 Claims**



1. An electronic thermometer apparatus for performing temperature measurements over a given range, comprising:

(a) a first sensing resistor exhibiting a relatively linear resistance variation over said range, a second reference resistor exhibiting a relatively constant resistance characteristic over said range, with said first and second resistors arranged in a series path,

(b) a switching circuit coupled to said first and second resistors in said series path and operative when activated to select said first resistor in a first mode and said second resistor in a second mode,

(c) an analog to digital converter coupled to said resistors via said switching circuit and responsive to provide a first output during said first mode and a second output during said second mode,

(d) first storage means for storing therein at least one value indicative of the characteristic of said second resistor at a given temperature,

(e) logic means responsive to said first resistor achieving a resistance value over said temperature range to thereby cause said switching means to select said second resistor and to compare the value of said second resistor with said stored value commencing when said first resistor achieves said value to respond to any excess over said stored value, and

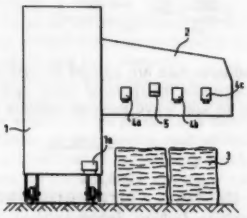
(f) means for converting said excess to the actual temperature within said range.

4,536,852

METHOD AND APPARATUS FOR DETERMINING THE HEIGHT OF TEXTILE FIBER BALES

Fritz Hösel, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 3, 1982, Ser. No. 414,948
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135272
Int. Cl.³ G06F *15/20;* **D01G** *7/08*
U.S. Cl. 364—562 **9 Claims**



1. Method for determining the height of textile fiber bales disposed in successive groups in the operative range of a bale opener which is arranged to move horizontally adjacent the bale groups, each bale group containing at least one bale of fibers of a selected type and the opener being provided with a detacher disposed above the bales, carrying a measuring device for measuring the height of each bale group, and movable vertically toward the bales for effecting such height measurement, comprising: effecting a plurality of measurements of the height of each bale of each group at a succession of horizontally spaced measuring locations by advancing the bale opener horizontally after each measurement; and forming an average of the measurements made on each bale group.

4,536,853

MULTIPLE WAVE GENERATOR

Kinji Kawamoto, Yahata; Masao Tsukamoto, Katano; Kazuhiro Murase, Hirakata; Tetsuhiko Kaneaki, Ashiya, and Masataka Nikaido, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

Filed Oct. 15, 1982, Ser. No. 434,709
Claims priority, application Japan, Oct. 15, 1981, 56-165189
Int. Cl.³ G06F *1/02, 7/38;* **G01H** *1/00*
U.S. Cl. 364—718 **9 Claims**

1. A multiple wave generator comprising:

a wave data memory for storing plural data samples of a wave shape;

a wave address register storing wave address data for partially designating said sampled data in said wave data memory;

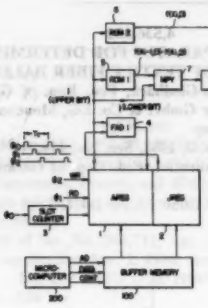
a difference address register for storing difference address data which are incremental address data;

a wave address calculator for adding said wave address data to said difference address data and for writing summed data into said wave address register, and for producing a set of new wave memory data and partial address data from said summed data; and

a wave calculator,

wherein said wave address data are composed of wave memory address data for addressing said wave data memory and partial address data which designate the interpolated position of said wave memory address, and wherein

said wave memory address data are applied to said wave data memory for reading out one of said plural data samples, and wherein said read out data samples and said



partial address data are applied to said wave calculator which calculates interpolated wave data samples corresponding to said wave memory address and said partial address.

4,536,854

DECIMAL ARITHMETIC UNIT

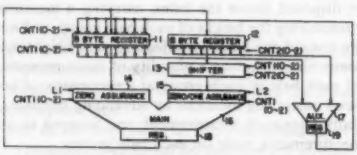
Tomoatsu Yanagita, Isehara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,330

Claims priority, application Japan, Aug. 12, 1981, 56-125179

Int. Cl.³ G06F *7/38*

U.S. Cl. 364—749 **10 Claims**



1. A decimal arithmetic unit for carrying out a decimal arithmetic operation for first and second operands each having a sign digit and numeric data, comprising:

arithmetic means for carrying out the decimal arithmetic operation;

sign processing means for processing the sign digits;

first circuit means for supplying the numeric data of said first and second operands excluding the sign digits to said arithmetic means;

second circuit means for supplying the sign digits of said first and second operands to said sign processing means; and

means for merging an output of said arithmetic means and an output of said sign processing means to produce an operation result;

wherein said first circuit means comprises:

zero assurance means connected to receive said first operand for changing the part of said first operand which is not numeric data to zero in accordance with the operand addresses and the operand length of the first operand and for applying the thus changed first operand to said arithmetic means:

aligning means for aligning the right end position of said second operand to the right end position of said first operand in accordance wthi the operand addresses of said first and second operands; and

zero/one assurance means connected to receive said second operand for changing the part of said second operand which is not numeric data to zero or one depending on the arithmetic operation to be performed by ssdi arithmetio means and for applying the thus changed second operand to said arithmetic means.

4,536,855

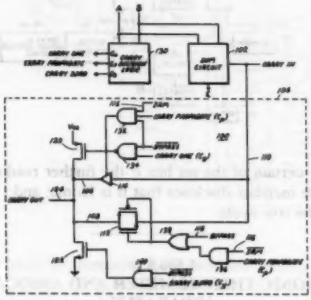
IMPEDANCE RESTORATION FOR FAST CARRY PROPAGATION

Steven G. Morton, Oxford, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,596

Int. Cl.³ G05F *7/50*

U.S. Cl. 364—786 **15 Claims**



1. An arithmetic adder including:

sum circuit means having first and second data inputs, a carry input and a summation output;

carry circuit means responsive to said carry input of said sum circuit means for providing a carry signal path having a selectable propagation delay time means for selecting a propagation delay time in accordance with configuration dependent information and fault location information; and

carry decision logic circuit means coupled to said carry circuit means and responsive to said first and second data inputs for connecting carry instructions to said carry circuit.

4,536,856

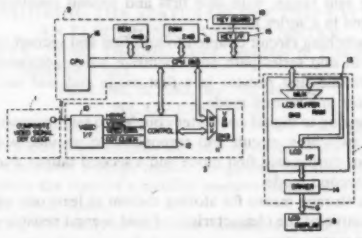
METHOD OF AND APPARATUS FOR CONTROLLING THE DISPLAY OF VIDEO SIGNAL INFORMATION

Akihiko Hiroishi, Tokyo, Japan, assignor to Sord Computer Systems, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 385,856, Jun. 7, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 656,401

Int. Cl.³ G06F *3/14*

U.S. Cl. 364—900 **8 Claims**



1. A method of displaying video signal information from the external microcomputer or other control system on LCD or other similar display devices, comprising the steps of:

supplying output video signals from the external microcom-

puter to input section including video interface means and display control means;

separating said output video signal through said video interface means into signal components including HSYNC, VSYNC, video data and data clock signals which are to be fed into said display control means;

storing count control data from a central processor (CPU) connected to said display control means through CPU control bus;

counting the number of occurrences of HSYNC and VSYNC signals until the number to be determined by said count control data, and then generating and providing the respective horizontal and vertical addresses to a video buffer memory;

counting the number of dot clock signals until the number to be determined by said count control data is reached, and then generating and providing a write pulse to said video buffer memory;

converting serial bit video data to parallel bit video data in accordance with the dot clock signals through a delay circuit means and providing said parallel video data to latch circuit means under control of clock signals;

transferring said video data to the video buffer memory and storing the same at the horizontal and vertical addresses therein in response to the write pulse; and

retrieving any desired portion of the video data from said video buffer memory and transferring it to the LCD display device through LCD buffer RAM.

4,536,857

DEVICE FOR THE SERIAL MERGING OF TWO ORDERED LISTS IN ORDER TO FORM A SINGLE ORDERED LIST

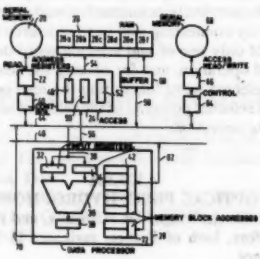
Wijnand J. Schoenmakers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1983, Ser. No. 471,974

Claims priority, application Netherlands, Mar. 15, 1982, 8201057

Int. Cl.[3] **G06F** *7/06, 13/06, 7/16, 7/36*

U.S. Cl. 364—900 **6 Claims**



1. A device for the merging of a first list A(i) of first elements which is ordered according to a first linear ordering criterion with a second list B(f) of second elements which is ordered according to a second linear ordering criterion in order to form a result list Z(t) of third elements which is ordered according to a third linear ordering criterion, so that each first element and each second element is represented by a third element, characterized in that said device comprises:

(a) a random access read/write memory M(j) (**26**) which contains a number (kmax)>2 of memory blocks (**26***a*. . . **26***f*), the (kmax−2) non-largest blocks thereof having a capacity which is sufficient for the storage of the second list;

(b) a serial memory input/output (**22, 66**) for receiving said first elements and outputting said third elements, said receiving and outputting having equal rates;

(c) a control device (**28**) for the merging operation, comprising:

(c1) a storage control device for successively storing said second elements in said (kmax−2) memory blocks;

(c2) indicator means for updating, when said serial memory input/output is activated, a first running write address (**48**) for the writing of said first elements, for updating a first running read address (**50**) for the first elements stored in the read/write memory, and for updating a second running read address (**52**) for the second elements stored in the read/write memory;

(c3) comparison means (**36**) for comparing, in a first state of said comparison means and according to the third linear ordering criterion, the first and second elements stored at said first and second running read addresses and indicated by the indicator means, and for making one element thereof available for supply to the serial memory input/output on the basis of the comparison;

(c4) a first block list updating device (**42**) for the updating of a series of start addresses of memory blocks used for the storage of said first elements;

(c5) a second block list updating device (**72**) for indicating the start addresses of at least two memory blocks and, under the control of the passing of a memory block end by the first or second running read address, for indicating the start address of the memory block thus vacated and, under the control of the passing of a memory block end by the first running write address, for making a start address of a memory block thus far indicated available to the indicator means as a new first write address for the storage of said first elements, and for deactivating the latter indication within the second block list updating device, at least two memory blocks outside said (kmax−2) memory blocks being indicated in an initial state;

(c6) vacating means for presenting, after the reception of the last one of said first elements on the serial memory connection, further first and/or second elements stored in the read/write memory to the serial memory connection in cooperation with said comparison means.

4,536,858

JUNCTION SHORT-CIRCUITING-TYPE PROGRAMMABLE READ-ONLY MEMORY DEVICE

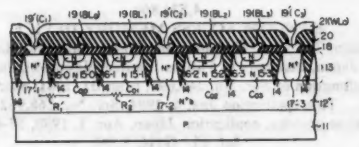
Kouji Ueno, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 6, 1982, Ser. No. 406,096

Claims priority, application Japan, Aug. 8, 1981, 56-124852

Int. Cl.[3] **G11C** *11/40*

U.S. Cl. 365—104 **6 Claims**



5. A junction short-circuiting-type programmable read-only memory (PROM) device having a plurality of word lines and bit lines, and formed on a semiconductor substrate of a first conductivity type, the device comprising:

a striped buried layer of a second conductivity type opposite that of the first conductivity type, formed on the semiconductor substrate, for forming a common collector region;

a striped epitaxial layer of the second conductivity type, formed on said striped buried layer, for forming striped collector regions;

base regions of the first conductivity type formed in said striped epitaxial layer;

emitter regions of the second conductivity type respectively formed in said base regions and, respectively, operatively connected to the plurality of bit lines; and

word line contact regions of the second conductivity type, having a high concentration of impurities, formed in said epitaxial layer, said word line contact regions respectively disposed between sets of two of said base regions and respectively, operatively connected to the plurality of word lines.

4,536,859

CROSS-COUPLED INVERTERS STATIC RANDOM ACCESS MEMORY

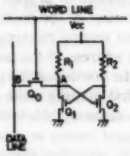
Setsufumi Kamaru, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 27, 1982, Ser. No. 412,378

Claims priority, application Japan, Aug. 31, 1981, 56-137923; Aug. 31, 1981, 56-137924; Jun. 7, 1982, 57-98181

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—154 **15 Claims**



1. A circuit for driving a MOS transistor circuit by generating an output signal having a voltage higher than the voltage of a power source with a boosting operation of a condenser, comprising:

the power source;

an output terminal;

a first enhancement-type MOS transistor connected between the power source and the output terminal;

a first condenser connected to the gate of the enhancement-type MOS transistor;

a second enhancement-type MOS transistor connected such that the source and the drain of the second enhancement MOS transistor are coupled to the power source and the gate of the first enhancement-type MOS transistor, and the gate of the second enhancement-type MOS transistor is coupled to the gate of the first enhancement-type MOS transistor; and

a second condenser connected to the output terminal.

4,536,860

RANDOM ACCESS MEMORY DEVICE

Kazuhiro Toyoda, Yokohama, and Haruo Shimada, Hino, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 249,695, Mar. 31, 1981, abandoned. This application Jan. 6, 1984, Ser. No. 568,952

Claims priority, application Japan, Apr. 1, 1980, 55-42489

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—190 **16 Claims**

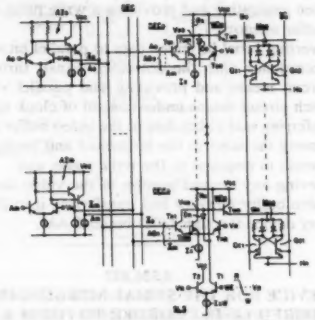
1. A random access memory device, operatively connected to receive first and second power supply voltages from first and second power supply lines, respectively, for performing read and write operations, said device comprising:

a plurality of memory cells arranged in a matrix form, each cell comprising a cross-connection transistor flip-flop circuit;

a plurality of word lines each having a selected potential and a non-selected potential, said word lines respectively connected to corresponding ones of said memory cells;

word drivers, each having selected and non-selected states, respectively operatively connected to said plurality of word lines, each having an input terminal for receiving selection signals, said word drivers providing said selected potential higher than said non-selected potential in accordance with the selection signals;

word decoders, each having an output terminal respectively connected to an input terminal at a corresponding one of said word drivers, for supplying the selection signals to said word drivers, each of said word decoders including resistor means, operatively connected between the first power supply line and a respective output terminal, for generating the selection signals, having a higher or lower potential in accordance with said selected and non-selected states of said word drivers, respectively; and



a selected word line level switching circuit, operatively connected to receive a read and write operation signal, and operatively connected to said plurality of word drivers, said selected word line level switching circuit comprising:

a current source; and

switching means, each of said switching means operatively connected to the input terminal of respective word drivers, and operatively connected to said current source, for selectively connecting said current source to said resistor means of only one of said selected word decoders during the read operation, and for making the selected potential of the selected word line during the read operation lower than the selected potential of the selected word line during the write operation.

4,536,861

OPTICAL FIBRE HYDROPHONE

Philippe Graindorge, Magny les Hameaux, and Hervé Arditty, Marly le Roy, both of France, assignors to Thomson-CSF, Paris, France

Filed Feb. 27, 1984, Ser. No. 583,644

Claims priority, application France, Feb. 25, 1983, 83 03130

Int. Cl.³ H04R *17/00*

U.S. Cl. 367—149 **15 Claims**

1. An optical fibre hydrophone for detecting sound waves in a medium, comprising:

means for transmitting and detecting radiation;

a measuring head immersed in said medium; and

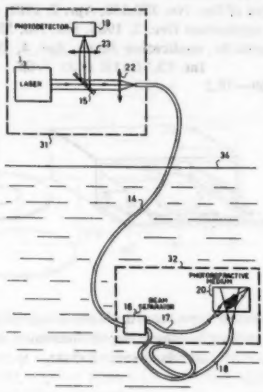
a monomodal waveguide element connecting said measuring head and said means for transmitting and detecting radiation;

said means for transmitting and detecting radiation including a monochromatic radiation source, means for detecting radiation and a first splitting means, said source and said means for detecting each being connected to said splitting means, said means for transmitting and detecting radiation introducing radiation into said waveguide element;

said measuring head including a second splitting means, a

monomodal optical waveguide element forming a reference arm, a photorefractive medium and a monomodal optical fibre forming a measuring arm, said measuring arm being immersed in said medium so as to contact said sound waves, while said reference arm, photorefractive medium and splitting means are protected from said medium and not in contact with said sound waves;

wherein said splitting means distributes a first and second fraction of said radiation to said measuring arm and said reference arm respectively, said second fraction being directed from said reference arm to a crystal angle of said



photorefractive medium and said first fraction being directed from said measuring arm in a different direction from said crystal angle, so as to intersect in said photorefractive medium and reenter said measuring arm and said reference arm;

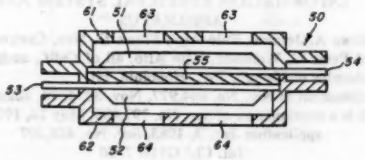
said second splitting means then recombining the radiation from said measuring arm and said reference arm, said radiation traveling through said waveguide element to said means for transmitting and distributing radiation, said first splitting means directing said radiation to said detecting means.

4,536,862

SEISMIC CABLE ASSEMBLY HAVING IMPROVED TRANSDUCERS

Lawrence B. Sullivan, Plano, and Charng-Wen M. Lo, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 24, 1982, Ser. No. 381,102
Int. Cl.³ G01V *1/38;* H04R *17/00*
U.S. Cl. 367—153 **20 Claims**



1. A seismic exploration system comprising:

(a) a seismic cable assembly having an acoustically transparent tubular enclosure;

(b) at least one pressure transducer electrically connected and positioned within the cable assembly enclosure including:

(1) an elastic, deformable, electrically-conductive housing arranged in at least two sections, the sections servicing as terminals for an electrical output to the cable assembly;

(2) insulating means positioned between the housing sections to electrically insulate the sections from each other and to form a fluid seal to provide a sealed chamber defined by the inside surfaces of the housing sections, the sealed chamber being filled with a non-pressurized, non-conductive gas; and

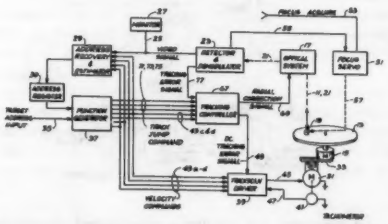
(3) at least two pressure-to-electrical devices electrically interconnected within the sealed chamber, mechanically and electrically connected to the inside surfaces of the two housing sections, respectively, within the sealed chamber so that the devices flex when pressure is applied to the enclosure causing the housing sections to deform providing an electrical output through the housing sections.

4,536,863

METHOD AND APPARATUS FOR RECOVERING INFORMATION FROM A VIDEODISC

Gary M. Giddings, Laguna Hills, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Apr. 15, 1982, Ser. No. 368,792
Int. Cl.³ G11B *21/08*
U.S. Cl. 369—43 **10 Claims**



1. A method for manipulating a track reader for recovering information from a selected target track of a plurality of spiralling and substantially circular information tracks or concentric circular information tracks on a record disc, each said track containing at least in part a unique track identifying code, said method comprising the steps of:

(a) generating a target track identifying code that matches the track identifying code of said target track;

(b) rotating the disc in a prescribed fashion;

(c) scanning the disc with the track reader at a prescribed radial velocity relative to the disc, toward the target track to recover information recorded thereon including track identifying codes;

(d) comparing recovered track identifying codes with said target track identifying code and detecting the difference therebetween;

(e) scanning continuously toward said target track until said comparing and detecting step indicates that the recovered track identifying code is within a fixed range of the target track identified code;

(f) thereafter moving the track reader incrementally within said range relative to said disc across a prescribed number of tracks during each revolution of the disc, toward the target track;

(g) upon passing the target track by detection in said comparing and detection step, that the difference between the recovered track identifying code and the target track identifying code is increasing, reversing the radial scanning direction;

(h) continuing said incremental scanning while continuing to detect the difference between the recovered track identi-

fying code and the target track identifying code, and continuing to reverse the radial direction of movement upon each detection of an increasing difference between the recovered track identifying code and the target track identifying code until a match is made therebetween, and in the absence of a match in a first prescribed period of time, incrementing the target track identifying code by a fixed value;

(i) continuing said incremental scanning toward said target track until a match between the recovered track identifying code and the incremented target track identifying code is found; and

(j) after a match is found, ceasing the relative radial movement across the disc and recovering the information from the arrived at track.

4,536,864

APPARATUS FOR READING AN OPTICALLY CODED DISC-SHAPED RECORD CARRIER

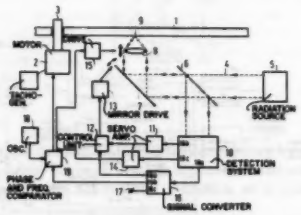
Gerard E. Van Rosmalen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,284

Claims priority, application Netherlands, Mar. 9, 1983, 8300844

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—44 **7 Claims**



1. An apparatus for reading a disc-shaped record carrier with a multi-turn spiral information track provided with optically readable digitally coded information, said digital information being recorded in the information track as a stream of data bits of constant spatial bit frequency independently of the diameter of the track turn and comprising a sequence of detectable information blocks with a fixed number of data bits, said apparatus comprising a radiation source for emitting a read beam, an optical system for projecting said read beam as a read spot on the record carrier, a detection system for detecting the information contained in the read beam after cooperation with the record carrier, means for converting said information into an electric information signal, means for rotating the record carrier at a speed such that the read spot scans the information track at a scanning speed which is n times higher than the scanning speed which would result in said electric information signal having a desired bit frequency, a positioning system for controlling the radial position of the read spot on the record carrier, and a servo-system for controlling said scanning speed so that said electric information signal has a constant first bit frequency which is a factor n higher than the ultimately desired bit frequency independently of the radial position of the read spot on the record carrier, said converting means comprising a memory device for storing, with the first bit frequency, the data bits of an information block being read and for subsequently supplying said data bits with the desired bit frequency, to thereby reduce the susceptability of said apparatus to disturbances caused by shocks, vibrations and the like during read-out of the information, said apparatus further comprising a control unit which is coupled to the positioning system for effecting a jump-back of the scanning spot by one track pitch at instants which are determined by said control unit, said control unit also being coupled to the memory device for determining the periods during which said data bits are read into the memory device such that as a result of the scanning pattern of the information track and the read-in periods, consecutive information blocks are read into the memory device in accordance with a cycle which is determined by the control unit and are subsequently supplied by said memory device as a continuous sequence of information blocks.

4,536,865

BOOKSHELF TYPE RECORD PLAYER

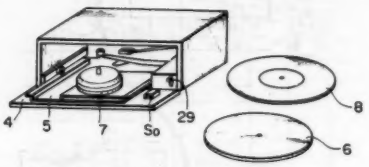
Isami Kenmostu, and Nobuyuki Isobe, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 250,330, Apr. 2, 1981, abandoned. This application Dec. 2, 1983, Ser. No. 557,396

Claims priority, application Japan, Apr. 4, 1980, 55-44241

Int. Cl.³ G11B *1/00, 3/08*

U.S. Cl. 369—75.2 **19 Claims**



1. A bookshelf type record player comprising:

a player cabinet having a depth dimension smaller than the diameter of a standard record disk;

a tone arm;

a turntable;

means for mounting said tone arm at a position adjacent a rear side of said player cabinet said tone arm being rotatable so as to normally extend substantially parallel to said rear side of said player cabinet when said record player is not in a play mode;

a turntable support member; and

means for movably mounting said turntable support member in said cabinet so that said turntable support member is movable between a play position and a record disc changing position, said record disc changing position being located further from said rear side of said player cabinet than said play position, and constituting a turntable attachment removal position,

said movable mounting means also being capable of moving said turntable support member in said player cabinet between a retracted position and said play position, said play position being located further from said rear side of said cabinet than said retracted position, said turntable being removed from said turntable support member prior to movement of the same to said retracted position.

4,536,866

INFORMATION RETRIEVAL SYSTEM AND APPARATUS

Jonathan A. Jerome, Palo Alto; Frank D. Neu, Castro Valley, and Peter G. Wohlmut, Palo Alto, all of Calif., assignors to Videonics of Hawaii, Inc., Honolulu, Hi.

Continuation of Ser. No. 964,977, Nov. 30, 1978, abandoned, which is a continuation of Ser. No. 797,485, May 16, 1977,. This application Jan. 3, 1983, Ser. No. 455,307

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—112 **46 Claims**

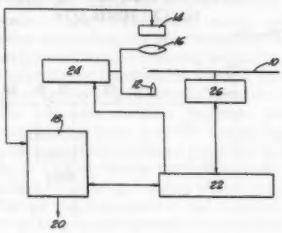
1. An electro-optical data retrieval system for retrieving data from a storage medium and of the type wherein relative motion is imparted between the recording medium and pickup means for causing said data to be scanned for retrieval thereof, comprising:

means for receiving a data-bearing storage medium having a relatively high density of data tracks thereon,

illuminance means for illuminating an area of said storage medium,

detector means including a matrix array of photosensitive elements, said array having predetermined dimensions,

focusing means for focusing an image of an area of interest within said illuminate area of said storage medium onto said detector means, the image of a data track being no smaller than a single photosensitive element, said array being dimensioned such that the area of interest does not extend beyond said array despite variations in the position of the area of interest with respect to the array due to variations in the location of the data relative to the detector means,



select circuit means including means for selecting at least one of said photosensitive elements of said array to provide an output signal of the system, said means for selecting including register means for selecting at least one of said photosensitive elements,

velocity detection means including external clock means responsive to signals from at least one of said photosensitive elements for determining increases and decreases in the rotational velocity of said storage medium, and

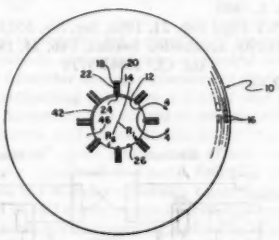
switching means responsive to said velocity detection means for selecting from said photosensitive elements at least one of said elements positioned so that the information to be retrieved is present at that element at the proper time as determined by said velocity detection means.

4,536,867

SELF-CENTERING DISC

Joseph B. Robinson, Scotts Valley, Calif., assignor to Qume Corporation, San Jose, Calif.

Filed Apr. 16, 1984, Ser. No. 600,724
Int. Cl.³ G11B *3/70, 7/24*
U.S. Cl. 369—282 **5 Claims**



1. A self-centering shaft-engaging disc, comprising:

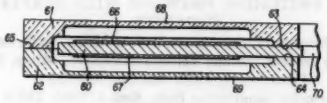
a disc formed of a single sheet of material defining a hole centered on the axis thereof, said disc having a plurality of slots extending into the walls surrounding said hole to form a plurality of fingers, including first and second groups of fingers with the fingers of said groups interspersed, at least three of said first fingers having radially inner ends lying on a first circle concentric with said disc axis, and said second fingers having radially inner ends lying on a second circle of greater diameter and concentric with said disc axis than the radius of said first circle, whereby when a shaft having a radius greater than the radius of said first circle is inserted through said central hole, the first group of fingers engage the shaft and center it on the axis of the disc.

4,536,868

PROTECTED OPTICAL DISK WITH A FREE LAYER HOLDER

Francois Langé , and Jean Cornet, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 6, 1983, Ser. No. 501,190
Claims priority, application France, Jun. 8, 1982, 82 09959
Int. Cl.³ G01D *15/32*
U.S. Cl. 369—284 **11 Claims**



1. An information optical storage device comprising:

a disc-shaped base member;

first and second confronting disc shaped protective members arranged one on each side of said disc-shaped base member, at least one of said protective members having an annular recess in confronting relationship with said base member;

a radiant-energy responsive recording medium disposed between said base member and one of said protective members within said annular information storage region, said storage region having a radially inner end with a radius greater than an inner radius of said annular recess and a radially outer end with a radius less than an outer radius of said annular recess, said base member being closely embraced between respective raised annular edges of said first and second protective members located only at one radial end of said storage region;

means for fastening said raised annular edges to lateral faces of said base member, at least one of said protective members having a further raised annular edge at a second radial end of said storage region, means for fastening said first and second protective members to one another along said further raised annular edges,

whereby said information storage region is exposed to an atmosphere enclosed by the combination of said protective members, the embraced portion of said base member and said fastening means and said base member having a free circumferential edge sufficiently spaced from said combination to prevent any contact therebetween as a result of relative radial and axial movements between said base member and said protective members.

4,536,869

OPTICAL DISK ASSEMBLY

Jasper S. Chandler, and Frederick F. Geyer, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

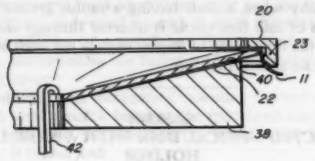
Filed Jan. 17, 1983, Ser. No. 458,494
Int. Cl.³ G01D *15/32*
U.S. Cl. 369—287 **7 Claims**

1. An optical disk assembly comprising:

a flexible, disk-shaped support carrying a record layer, said support having an information storage region and an annular peripheral region radially outward of said storage region; and

an annular retaining ring engaging said peripheral region of said support, said retaining ring comprising outer and

inner ring members on radially opposed sides of said support, and said inner ring member being resiliently



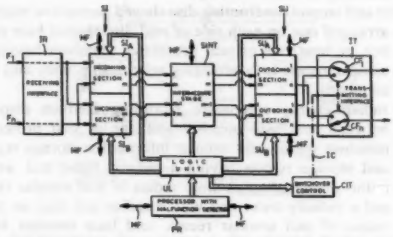
inwardly deformed to reduce its outer diameter so as to be urged toward said outer ring member to capture said support therebetween.

4,536,870

PCM SWITCHING NETWORK WITH SURPLUS CAPACITY

Amilcare Bovo, and Luigi Canato, both of Milan, Italy, assignors to Italtel Societa Italiana Telecomunicazioni, Milan, Italy

Filed Sep. 1, 1983, Ser. No. 528,535
Claims priority, application Italy, Sep. 1, 1982, 23078 A/82
Int. Cl.³ H04J *1/16, 3/14*
U.S. Cl. 370—16 **4 Claims**



1. A switching network for selectively interconnecting channels from an incoming PCM links to channels of n outgoing PCM links, comprising:

a receiving-side stage formed by a pair of mutually identical first sections each having a multiplicity of switching units with a total of n first input terminals and m first output terminals, m being not more than n nor less than n/2, each incoming PCM link being connected in parallel to a respective pair of homologous input terminals of said first sections;

a transmitting-side stage formed by a pair of mutually identical second sections each having a multiplicity of switching units with a total of m second input terminals and n second output terminals;

a single intermediate stage having a multiplicity of switching units with a total of $2m$ third input terminals connected to respective first output terminals and $2m$ third output terminals connected to respective second input terminals, the switching units of said intermediate stage establishing a plurality of alternative signal paths between any switching unit of said receiving-side stage and any switching unit of said transmitting-side stage;

switchover means for connecting each outgoing PCM link to either one of a respective pair of homologous output terminals of said second sections; and

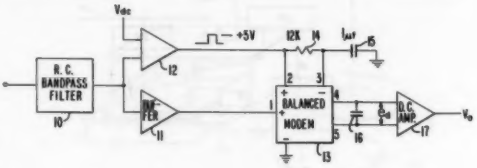
logic means responsive to instructions from a processor for controlling said stages to route, by way of switching units of said intermediate stage, traffic from some incoming links exclusively through switching units of one of said first sections and switching units of one of said second sections and traffic from other incoming links exclusively through switching units of the other of said first sections and switching units of the other of said second sections, with setting of said switchover means to extend the signals paths from said second sections to selected outgoing PCM links, said logic means being responsive to commands from said processor upon detection of a malfunctioning switching unit to reroute traffic from the malfunctioning switching unit to an available switching unit of the same stage for passage over an alternative path.

4,536,871

SIGNAL DETECTOR APPARATUS

Tom L. Blackburn, San Jose, Calif., assignor to GTE Communications Products Corporation, Phoenix, Ariz.

Filed Jul. 26, 1983, Ser. No. 517,310
Int. Cl.³ H04B *1/14*
U.S. Cl. 370—74 **10 Claims**



1. A carrier level detection circuit comprising:

first filter means having an input and an output for selecting a desired carrier signal;

a switching means connected to said filter means output and converting said carrier signal to a square-wave signal having a repetition rate corresponding to the frequency of said carrier signal; and

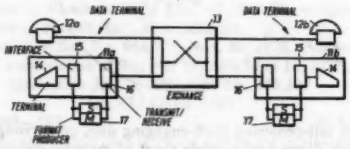
a balanced modem having a first signal input, a switched signal input and an output, said switched signal input receiving said square-wave signal, said first signal input receiving said carrier signal, said balanced modem producing an output signal equal to the product of the input signals applied thereto and said output signal having a DC magnitude proportional to the magnitude of said carrier signal.

4,536,872

TELECOMMUNICATION SYSTEM FOR TRANSMITTING DATA INFORMATION BY MEANS OF A DIGITAL EXCHANGE

Mauritz J. B. Lahti, Huddinge, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE83/00055, § 371 Date Oct. 13, 1983, § 102(e) Date Oct. 13, 1983, PCT Pub. No. WO83/03036, PCT Pub. Date Sep. 1, 1983
PCT Filed Feb. 21, 1983, Ser. No. 552,045
Claims priority, application Sweden, Feb. 24, 1982, 8201154
Int. Cl.³ H04J *3/16*
U.S. Cl. 370—82 **3 Claims**



1. In a telecommunication system including a telecommunication exchange for handling digital information and at least two data terminals, apparatus for transmitting data information between the data terminals via the telecommunication exchange comprising:

first means for connecting one of the two data terminals to the telecommunication exchange, said first means comprising at least, word forming means connected to the data terminal for subdividing the data flow into data words of given length, buffer means for storing a variable plurality of the words of given length received from said word forming means, frame forming means for generating a heading word for a frame, said heading wording including a frame locking word for synchronization and a frame length word for indicating the number of data words in a frame, counting means for counting the number of data words in said buffer means, transmission means for transmitting frames of words to the telecommunication exchange, and control means for controlling the switching of words from said frame forming means and from said buffer means to said transmission means, said control means further controlling the insertion of the count of the data words counted by said counting measn into the heading word prior to the transmission thereof; and

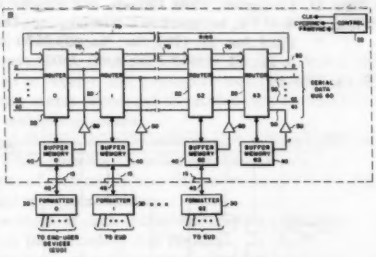
second means of connecting the other of the two data terminals to the telecommunication exchange, said second means comprising at least, receiver means connected to said telecommunication exchange for receiving frames of words, frame locking means for determining the beginning of frames by locating heading words in the received frames, filter means responsive to said receiver means and said frame locking means for separating the data words of the frames from the heading words, and forwarding means for sending the separated data words to said other data terminal.

4,536,873

DATA TRANSMISSION SYSTEM

Tom G. Leete, Plano, Tex., assignor to Honeywell Inc., Phoenix, Ariz.

Filed Mar. 19, 1984, Ser. No. 591,292
Int. Cl.³ H04J 3/02
U.S. Cl. 370—85 **9 Claims**



1. A central station, having a plurality of input/output formatters operatively connected to said central station, each input/output formatter having a plurality of devices coupled thereto, for exchanging data from a first of said plurality of input/output formatters to a second of said plurality of input/output formatters, said central station comprising:

(a) a plurality of router means, each of said router means operatively connected to a serial data bus, wherein said serial data bus includes a plurality of serial data bus lines, and each of said router means operatively connected to a next adjacent router means via a plurality of parallel lines thereby forming a ring, each of said router means for controlling the exchange of said data in response to a corresponding control message transmitted by each of said router means via said ring during a first cycle to indicate transmission of said data from the first of said plurality of input/output formatters on its corresponding serial data bus lines during a next sequential cycle; and

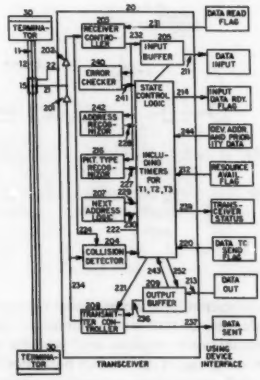
(b) a plurality of buffer memory means, each buffer memory means operatively connected to a corresponding router means and operatively connected to a corresponding input/output formatter, and further operatively connected to the corresponding serial data bus line of said serial data bus, for interfacing with the corresponding router means to cause said data to be operatively coupled to and from the serial data bus in response to said control message.

4,536,874

BANDWIDTH EFFICIENT MULTIPOINT DATA COMMUNICATION SYSTEM

James C. Stoffel, 368 Council Rock Ave., Rochester, N.Y. 14610, and Chander B. Ramchandani, 1107 Bettstrail Way, Potomac, Md. 20854

Filed Jul. 21, 1983, Ser. No. 515,696
Int. Cl.³ H04J 3/02
U.S. Cl. 370—85 **21 Claims**



1. A data communication system comprising:

a communication medium including a plurality of taps for making connection therewith, said medium providing for the coupling of signals along said taps;

a plurality of transceivers connected by respective ones of said taps to said medium, each of said transceivers including means for transmitting a signal into said medium and means for receiving a signal communicated via said medium, said transceivers and said medium constituting a communication network;

interface means coupled to respective ones of said transceivers for interfacing said transceivers with utilization devices;

each of said transceivers including permit means comprising circuitry for generating a network-access permit in the form of a digital signal, and means for passing the permit via said transmitting means and said medium from one of said transceivers to another of said transceivers;

each of said transceivers further comprising permit-checking means for enabling transmission by said transmission means, in any one of said transceivers said enabling of said transmission being in response to the presence of said permit at said one transceiver;

each of said transceivers further comprising means for detecting errors when more than one transceiver attempts to utilize said medium at the same time, said error detecting means signaling when a transceiver assumes ownership of the permit, and logic means including means to reestablish error free network communication;

said logic means in each of said transceivers designating a sequence of communication among the transceivers while permitting an addition and a deletion of transceivers to the

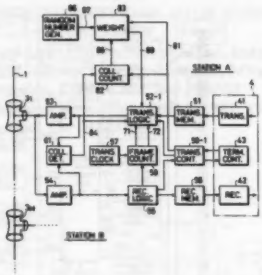
network without need to reinitialize other ones of the transceivers in the network

whereby any one of said transceivers is enabled to transmit a message to another of said transceivers only upon the presence of said permit at said one transceiver so as to prevent a concurrent transmission of messages by more than one receiver.

4,536,875
RETRANSMISSION CONTROL SYSTEM

Hiroshi Kume, and Yoichi Tan, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,006
Claims priority, application Japan, Jun. 29, 1982, 57-110592
Int. Cl.³ H04J 3/02, 6/00
U.S. Cl. 370—85 **18 Claims**



1. A multi-station communications network of the type wherein a plurality of stations communicate with one another over a communication medium and wherein data signals on said medium are grouped into frames periodically occurring on a time axis, with each frame comprising a plurality of successively occurring blocks, each station including means for transmitting packet signals onto said medium to occupy a previously unoccupied block, whereby multiplexed digital signals are transmitted on said medium in a time division manner, said network including a retransmission control system for determining a retransmission time interval after which a particular station will retransmit its signals after a collision has occurred in one block between the signals of at least two different stations, the improvement characterized in that said retransmission control system determines said retransmission time interval of said particular station in accordance with at least one of a degree of congestion in the frame in which a collision has occurred and the type of data being transmitted in the packet signal of said particular station.

4,536,876
SELF INITIALIZING PHASE LOCKED LOOP RING COMMUNICATIONS SYSTEM

Richard G. Bahr, Framingham, and Thomas C. Hogan, Natick, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

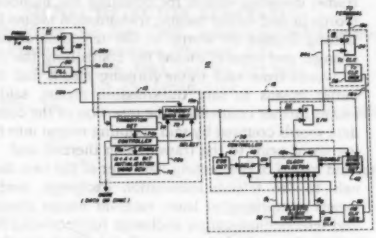
Filed Feb. 10, 1984, Ser. No. 579,088
Int. Cl.³ H04J 3/00, 3/06
U.S. Cl. 370—86 **9 Claims**

1. A ring communications system comprising a plurality of terminals coupled together to provide a unidirectional communications ring, each of said terminals comprising:

A. means for transmitting digital signals at a transmit data rate (1/T) associated with said terminal to the next downstream terminal, said transmitting means being operative in a first state to transmit run length limited digital signals having fewer than N consecutive bits having the same value, and operative in a second state to transmit digital signals having N+A consecutive bits having the same binary value, followed by at least one bit having the other binary value,

B. means for receiving digital signals from the next upstream terminal, said receiving means including:

i. a phase locked loop (PLL) means for generating a receive (Rx) clock signal from said received digital signal, said PLL means including a phase locked loop having a characteristic hold time (H) exceeding its characteristic lock time (L) and where (N+A)×T is less than H,



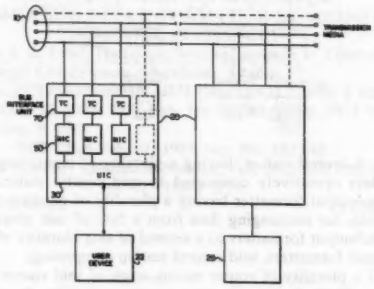
ii. shift register means for re-clocking said received digital signals in response to said Rx clock signal

C. control means for detecting signal level transitions in said re-clocked digital signals, and means operative when N consecutive bits of said re-clocked digital signals have the same value, for controlling said transmitting means to be in its second state for a period equal to (N+A+M)×T, where M is greater than or equal to 1, and A is greater than or equal to 0, and for controlling said transmitting means to be in its first state otherwise.

4,536,877
TACK-ON ACKNOWLEDGMENT IN COMPUTER NETWORKS

William D. Livingston, Falls Church, and Eugene E. Jacob, Vienna, both of Va., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jan. 21, 1983, Ser. No. 459,897
Int. Cl.³ H04J 3/00, 6/00, 3/02
U.S. Cl. 370—94 **4 Claims**



1. A method of communicating data, comprising the steps of:

(a) transmitting data;

(b) receiving and storing without acceptance the transmitted data;

(c) evaluating the stored data for validity;

(d) acknowledging receipt of the data if evaluated to be valid;

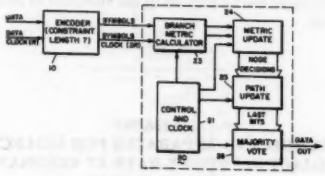
(e) transmitting an abort message when no valid acknowledgement is received within a first, predetermined time period; and

(f) accepting the stored data if not aborted within a second, predetermined time period.

4,536,878
BIT SERIAL CONVOLUTIONAL DECODER FOR VLSI IMPLEMENTATION

Glen D. Rattlingourd; Robert J. Currie, both of Salt Lake City, and Stanley D. Moss, Kaysville, all of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 20, 1982, Ser. No. 429,315
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—43 14 Claims



1. A decoder circuit comprising,

calculator means (23) for receiving coded symbol signals and producing calculator output signals representative of said symbol signals,

said calculator means includes serial-to-parallel converter means for converting said symbol signals to parallel output signals,

full adder means connected to said serial-to-parallel converter to receive said parallel output signals and produce said calculator output signals which are representative of said symbol signals,

evaluator means (24) for receiving said calculator output signals from said calculator means and producing evaluator output signals which indicate a minimum value of said calculator output signals and are used in establishing the output signals to be produced by the decoder circuit,

convergence means (25) for receiving said evaluator output signals from said evaluator means and producing convergence output signals representative of the most probable signal conditions,

said convergence means includes multiplexer means connected to receive said evaluator output signals and shift register means connected to receive output signals from said multiplexer means,

said shift register means comprises a plurality of shift registers and a plurality of multiplexer devices,

one input of each multiplexer device connected to an output of said multiplexer means,

another input of each multiplexer device connected to an output the preceding shift register,

the output of each multiplexer device connected to an input of the succeeding shift register, and

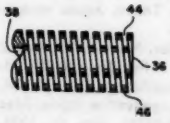
valuation means (26) for receiving said convergence output signals from said convergence means and producing a decoder output signal representative of the coded symbol signals supplied to said calculator means.

4,536,879
PYROTECHNIC LAMP

Cathy J. Reed, Nashua, and Thomas M. Pollak, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 19, 1983, Ser. No. 524,804
Int. Cl.³ H01S *3/091*
U.S. Cl. 372—77 14 Claims

1. In a pyrotechnic lamp including a metal whose combustion in oxygen occurs at sufficiently high temperatures to produce optical radiation, a source of oxygen which will maintain combustion of the metal, means for providing a sustained flow of the oxygen past the metal, and, a rod for supporting and igniting the metal, the improvement for providing extended burn duration, uniform heating and ignition, and reproduceable optical radiation comprising:

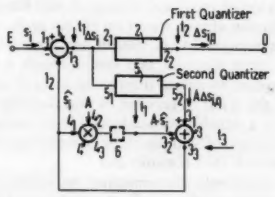


the metal is a symmetrical member having a centered longitudinal bore adapted to receive the rod therein and having the outer surface thereof finned.

4,536,880
DIGITAL DPCM-CODER HAVING A HIGH PROCESSING SPEED

Hans-Joachim Grallert, Groebenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,561
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232558
Int. Cl.³ H04B *12/04;* H03K *13/22*
U.S. Cl. 375—30 3 Claims



1. A digital DPCM-coder having a high processing speed with fewer calculating operations, comprising:

an adder having first and second inputs and an output;

a subtractor having first and second inputs and an output;

a multiplier means having an input and an output;

a first quantizer means having an input and output;

a second quantizer means having an input and output;

a PCM signal input connecting to the first input of the subtractor;

the output of the subtractor being connected to the input of the first quantizer means, said first quantizer means outputting quantized DPCM-signals;

a calculating loop means connected between the output of the subtractor and the second input of the subtractor, said calculating loop means determining an estimated value which is fed to said subtractor second input; and

said calculator loop means comprising the second quantizer means whose output is connected to the first input of the adder, the output of the adder connecting to the input of the multiplier means which multiplies with a prediciton factor A, the output of the multiplier means connecting to the second input of the adder, and the output of the adder connecting to the second input of the subtractor.

4,536,881

INTEGRATED LOGIC CIRCUIT ADAPTED TO PERFORMANCE TESTS

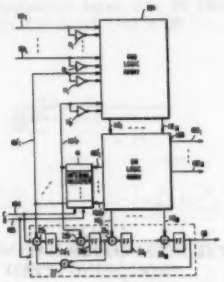
Yoshihiro Kasuya, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Continuation of Ser. No. 409,787, Aug. 20, 1982, abandoned, which is a division of Ser. No. 130,687, Mar. 17, 1980, Pat. No. 4,366,393. This application Oct. 27, 1983, Ser. No. 545,608

Claims priority, application Japan, Mar. 15, 1979, 54-30243; Mar. 15, 1979, 54-30253; Mar. 15, 1979, 54-30254; Mar. 15, 1979, 54-30256

Int. Cl.³ G11C *19/00*

U.S. Cl. 377—70 5 Claims



1. An easily testable integrated logic circuit, comprising:

a combinational logic circuit receiving a plurality of first inputs and a plurality of second inputs for providing logic outputs;

a feedback shift register having an output and including a plurality of first through n-th series-connected flip-flops each having an input and an output, said flip-flops receiving in parallel at least a portion of said logic outputs from said combinational logic circuit and advancing said outputs in series through said first through n-th flip-flops while feeding an output from at least one of said flip-flops back to the input of another of said flip-flops to thereby compress a signal sequence in said logic outputs, the output of any one of said flip-flops constituting the output of said feedback shift register; and

means for selectively disconnecting the series connection of said flip-flops whereby each of said flip-flops receives and stores a respective one of said portion of said logic outputs received in parallel from said combinational logic circuit, at least a portion of said outputs of said flip-flops being fed back in parallel as said second inputs to said combinational logic circuit when said series connection of said flip-flops is disconnected.

4,536,882

EMBEDDED ABSORBER X-RAY MASK AND METHOD FOR MAKING SAME

Addison B. Jones, Yorba Linda, and Siegfried G. Plonski, Santa Ana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 3,062, Jan. 12, 1979, abandoned. This application Feb. 7, 1980, Ser. No. 119,331

Int. Cl.³ G21C *11/00*; G02B *5/00*; G03F *11/00*; B05B *5/00*

U.S. Cl. 378—35 9 Claims

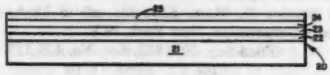
1. A method of making an X-ray mask for X-ray lithography comprising the steps of:

providing a substrate for supporting the mask membrane of the X-ray mask during fabrication thereof;

depositing a thin layer of material which is opaque to X-ray or charged particle radiation on said substrate, said thin layer having a thickness less than that of said substrate;

patterning said thin layer to form a mask pattern;

applying a mask membrane layer of a high X-ray transmissive material over said patterned thin layer; and



removing at least a portion of the substrate to form an X-ray mask.

4,536,883

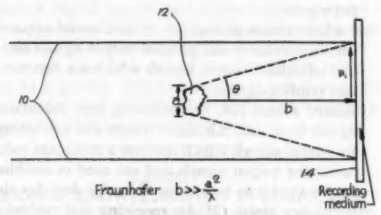
METHOD AND APPARATUS FOR MOLECULAR IMAGING USING X-RAYS AT RESONANCE WAVELENGTHS

George F. Chapline, Jr., Alamo, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 30, 1982, Ser. No. 445,596

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—36 9 Claims



1. A method of producing images representing the molecular structure of an object, comprising the steps of directing a beam of coherent X-rays upon the object to produce scattering of the X-rays by the object, producing interference on a recording surface between the scattered X-rays from the object and unscattered coherent X-rays such that holograms are produced on said recording surface, and establishing the wavelength of the X-rays to correspond with a spectral resonance of a constituent of said object so as to improve the quality of the holograms as representations of molecular structures involving such constituent.

4,536,884

PLASMA PINCH X-RAY APPARATUS

Arnold Weiss, Minneapolis, Minn.; Herman P. Schutten; Louis Cartz, both of Milwaukee, Wis.; Gordon B. Spellman, Mequon, Wis.; Stanley V. Jaskolski, Sussex, Wis., and Peter H. Wackman, deceased, late of Wauwatosa, Wis. (by Connie M. Wackman, personal representative), assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 20, 1982, Ser. No. 420,558

Int. Cl.³ H01J *35/00*; H05B *31/22*

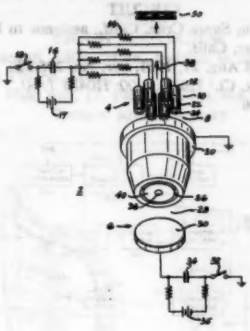
U.S. Cl. 378—119 23 Claims

1. Apparatus for producing X-rays, comprising:

means for repeatably generating vapor directly from the same piece or pieces of solid material; and

means including axially spaced electrodes for generating X-rays by passing a high current axially between said axially spaced electrodes through said vapor causing

magnetic field plasma pinching radially inwardly perpendicularly to the axial current flow,



wherein said vapor generating means includes means for repeatably generating plasma vapor by passing high current along solid material means.

4,536,885

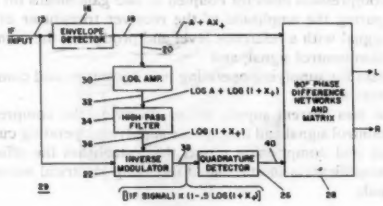
DISTORTION CORRECTING AM STEREO RECEIVER WITH NON-FLAT AGC

Bernard D. Loughlin, Centerport, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Division of Ser. No. 354,332, Mar. 3, 1983,. This application Dec. 27, 1983, Ser. No. 565,303

Int. Cl.[3] H04H *5/00*

U.S. Cl. 381—15 **3 Claims**



1. An inverse amplitude modulator having a modulation characteristic of the form

$$\frac{A}{1 + .5B}$$

with respect to a supplied modulating signal (B) and a supplied signal (A) which is to be inversely modulated, comprising:

means for supplying a first signal, comprising said modulating signal (B) and a DC component, in the form (1 + B);

means for supplying a second signal comprising said signal to be modulated (A);

means for logarithmically amplifying said first signal and for developing a third signal (C) comprising substantially only the AC components of said logarithmically amplified signal;

and means, having a modulation characteristic of the form A(1 − 0.5C), for inversely modulating said second signal (A) by said third signal (C);

whereby with respect to the supplied signals (A) and (B), said combination exhibits a modulation characteristic substantially of the desired form

$$\frac{A}{1 + .5B}$$

4,536,886

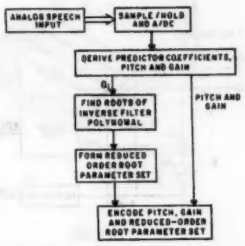
LPC POLE ENCODING USING REDUCED SPECTRAL SHAPING POLYNOMIAL

Panos E. Papamichalis, and George R. Doddington, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 3, 1982, Ser. No. 373,959

Int. Cl.[3] G10L *1/00*

U.S. Cl. 381—41 **11 Claims**


ANALOG SPEECH INPUT
SAMPLE / HOLD AND A/DC
DERIVE PREDICTOR COEFFICIENTS, PITCH AND GAIN
FIND ROOTS OF INVERSE FILTER POLYNOMIAL
PITCH AND GAIN
FORM REDUCED ORDER ROOT PARAMETER SET
ENCODE PITCH, GAIN AND REDUCED-ORDER ROOT PARAMETER SET

1. A method for encoding a speech input signal, comprising the steps of:

sampling a speech signal;

defining an inverse filter polynomial corresponding to said speech signal;

finding the roots of said inverse filter polynomial;

encoding all of said roots of said inverse filter polynomial which have bandwidth greater than a threshold bandwidth to provide a first output signal;

multiplying together roots of said inverse filter polynomial which do not have a bandwidth greater than said threshold bandwidth, to produce a residual polynomial;

defining reflection coefficients corresponding to said residual polynomial;

encoding parameters corresponding to a truncated set of said reflection coefficients of said residual polynomial to provide a second output signal; and

storing or transmitting said first and second output signals.

4,536,887

MICROPHONE-ARRAY APPARATUS AND METHOD FOR EXTRACTING DESIRED SIGNAL

Yutaka Kaneda, Tanashi, and Juro Ohga, Kamakura, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 539,891

Claims priority, application Japan, Oct. 18, 1982, 57-182355; Aug. 15, 1983, 58-149500

Int. Cl.[3] H04R *1/22*

U.S. Cl. 381—92 **29 Claims**

1. A microphone-array apparatus comprising:

a plurality of microphone elements for receiving acoustic signals;

first delay means connected to the microphone elements, for delaying their output signals for different periods of time to output a plurality of delayed signals;

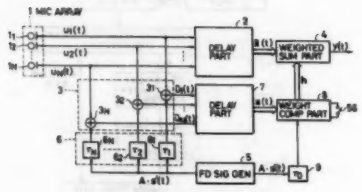
first weighted summation means connected to the first delay means, for weighting and summing up the plurality of delayed output signals to extract desired signals from the signals produced by the microphone elements while at the

same time reducing unnecessary signals contained in the received acoustic signals;

fictitious desired signal generating means for electrically generating a fictitious desired signal;

first adding means for adding the fictitious desired signal from the fictitious desired signal generating means and the output signal of each of the microphone elements;

second delay means connected to the first adding means, for



delaying the added signals therefrom in the same manner as in the first delay means; and

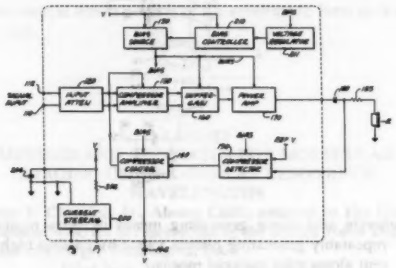
weighting value determining means connected to the second delay means and the fictitious desired signal generating means, for computing weighting values of the first weighted summation means in a manner to minimize a predetermined measure through using the plurality of delayed output signals from the second delay means and the fictitious desired signal.

4,536,888

VOICE COMMUNICATION INSTRUMENT SYSTEM WITH LINE-POWERED RECEIVER CONDITIONING CIRCUIT

Donald R. Wilson, Santa Cruz, Calif., assignor to Plantronics, Inc., Santa Cruz, Calif.

Filed Aug. 21, 1981, Ser. No. 295,220
Int. Cl.³ H03G 7/00; H04M 1/60
U.S. Cl. 381—106 **11 Claims**



1. A receiver conditioning circuit for providing conditioned receiver audio signals comprising:

input circuit means, for attenuating incoming electrical voice signals;

means for linearly applying compression to attenuated incoming electrical voice signals in response to a compression control signal, to limit said signals to specific maximum level;

means coupled to said signal compression means, for providing signal gain to compressed signals, and for generating a signal to drive a receiver transducer receiver audio signals;

a compression detector coupled to said gain means for comparing the amplitude of the receiver transducer driving signal with a reference level and producing the compression control signal; and

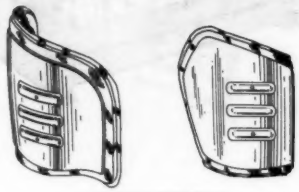
means for supplying operating bias current to said compression means;

said bias current supply means receiving the compression control signal and in response supplying operating current to said compression means that establishes the effective amplification of attenuated incoming electrical voice signals.

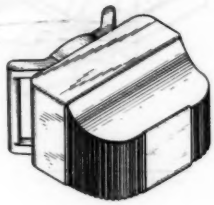
DESIGNS

AUGUST 20, 1985

280,145
THIGH PROTECTOR
Eugene J. Vacanti, Edina, Minn., assignor to Sports Marketing, Inc., Eden Prairie, Minn.
Filed Aug. 17, 1982, Ser. No. 408,856
Term of patent 14 years
U.S. Cl. D2—27



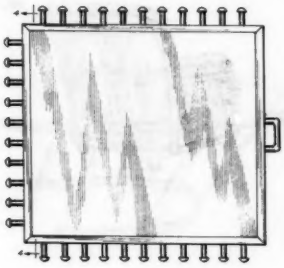
280,146
BELT HOLDER FOR A PORTABLE RADIO OR THE LIKE
James P. Liautaud, River and Bluff Rds., Trout Valley, Cary, Ill. 60013; Peter F. Stultz, Elgin, and David L. Maloney, Barrington, both of Ill., assignors to James P. Liautaud, Cary, Ill.
Filed Sep. 6, 1983, Ser. No. 529,955
Term of patent 14 years
U.S. Cl. D2—400



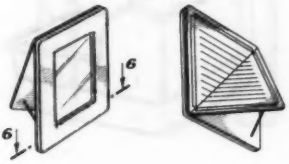
280,147
COWBOY HAT
Natalie A. Wolff, Arlington, Tex., assignor to Container Corporation of America, Chicago, Ill.
Filed Jun. 21, 1982, Ser. No. 390,273
Term of patent 14 years
U.S. Cl. D2—258

280,148
THREAD DISPENSER/PLEATER PLATFORM
Bettye G. Rodgers, 2903 Bannockburn Rd., Memphis, Tenn. 38128
Filed Jun. 8, 1983, Ser. No. 502,190
Term of patent 14 years
U.S. Cl. D3—25

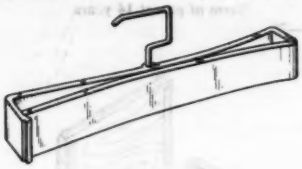
280,149
HOBBY BOARD FOR SEWING AND THE LIKE
Velma De Jiacomo, 14231 E. Marina Dr., Aurora, Colo. 80014
Filed Jul. 18, 1983, Ser. No. 514,635
Term of patent 14 years
U.S. Cl. D3—26



280,150
COMBINED CERAMIC GREETING CARD AND PHOTOGRAPHIC MOUNTING APPARATUS
Steven R. Pargman, Los Angeles, Calif., assignor to Terragrafics, Inc., Los Angeles, Calif.
Filed Mar. 25, 1983, Ser. No. 478,736
Term of patent 14 years
U.S. Cl. D6—311



280,151
CLOTHES HANGER FOR SKIRTS, TROUSERS AND THE LIKE
Michael H. Tooke, Woodland Hills, Calif., assignor to Allen Mansfield, Pacific Palisades, Calif.
Filed Dec. 20, 1982, Ser. No. 456,719
Term of patent 14 years
U.S. Cl. D6—326

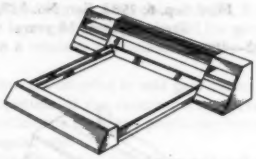


280,152
SEAT
Gianbattista Giudici, Seveso, Italy, assignor to Altera Salotti S.R.L., Como, Italy
Filed Sep. 15, 1982, Ser. No. 418,304
Term of patent 14 years
U.S. Cl. D6—370

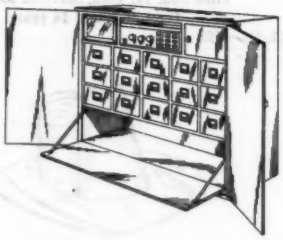
280,153
SEAT
Hans Hopfer, Paris, France, assignor to Alex Synn AG, Cham, Switzerland
Filed Dec. 28, 1982, Ser. No. 454,101
Term of patent 14 years
U.S. Cl. D6—378

280,154
SOFA
Alessandro, 45 E. 89 St., Suite 10A, New York, N.Y. 10028
Filed Oct. 22, 1982, Ser. No. 436,135
Term of patent 14 years
U.S. Cl. D6—381

280,155
COMBINED BED AND HEADBOARD LAMP
Jan H. Matthias, Beverly Hills, Calif., assignor to Casa Bella Imports, Inc., Miami, Fla.
Filed Jul. 2, 1982, Ser. No. 394,655
Term of patent 14 years
U.S. Cl. D6—383



280,156
EMERGENCY MEDICAL CABINET
Richard T. Allen, Easton, Md., and David A. Hammond, 18347 Loft Knife Cir., Gaithersburg, Md. 20879, assignors to David H. Hammond, Gaithersburg, Md.
Filed Oct. 26, 1982, Ser. No. 436,880
Term of patent 14 years
U.S. Cl. D6—432

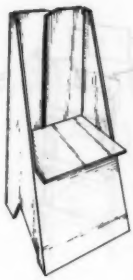


280,157
ETAGERE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Mar. 3, 1983, Ser. No. 471,810
Term of patent 14 years
U.S. Cl. D6—474

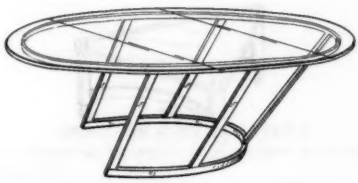
280,158
ETAGERE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Mar. 3, 1983, Ser. No. 471,812
Term of patent 14 years
U.S. Cl. D6—474

280,159
COLLAPSIBLE DISPLAY UNIT
William V. Silver, New York County, N.Y., assignor to Thomson-Leeds Company Inc., New York, N.Y.
Filed Aug. 30, 1982, Ser. No. 412,566
Term of patent 14 years
U.S. Cl. D6—475

280,160
COLLAPSIBLE DISPLAY UNIT
William V. Silver, New York, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.
Filed Aug. 30, 1982, Ser. No. 412,568
Term of patent 14 years
U.S. Cl. D6—475

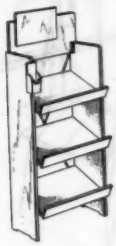


280,161
TABLE
Alessandro, 45 E. 89 St. Suite 10A, New York, N.Y. 10028
Filed Oct. 22, 1982, Ser. No. 436,148
Term of patent 14 years
U.S. Cl. D6—480

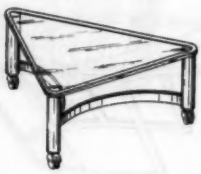


280,162
TABLE
R. Scott Bromley, New York, N.Y., assignor to Cartier, Inc., New York, N.Y.
Filed Oct. 7, 1982, Ser. No. 433,353
Term of patent 14 years
U.S. Cl. D6—484

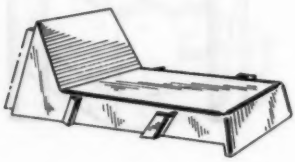
280,163
WINE DISPLAY RACK OR SIMILAR ARTICLE
Daniel W. Leo, Sr., New York, N.Y., assignor to Ledan, Inc., New York, N.Y.
Filed Jun. 3, 1983, Ser. No. 500,889
Term of patent 14 years
U.S. Cl. D6—473



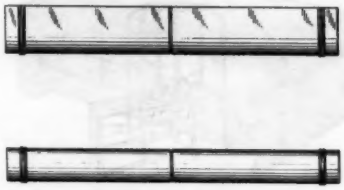
280,164
TABLE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Mar. 3, 1983, Ser. No. 471,800
Term of patent 14 years
U.S. Cl. D6—489



280,165
SEPARATOR FOR CIGARETTE PACKS
William V. Silver, New York, N.Y., assignor to Thomson-Leeds Company Inc., New York, N.Y.
Filed Aug. 30, 1982, Ser. No. 412,565
Term of patent 14 years
U.S. Cl. D6—509

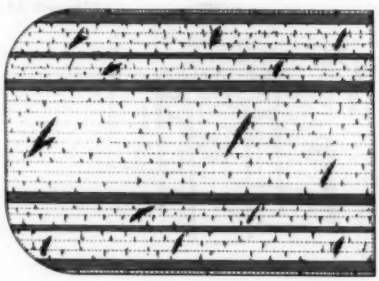


280,166
FURNITURE SHELF
R. Scott Bromley, New York, N.Y., assignor to Cartier, Inc., New York, N.Y.
Filed Oct. 7, 1982, Ser. No. 433,355
Term of patent 14 years
U.S. Cl. D6—511



280,167
SOAP DISPENSER
Henry C. Keck, South Pasadena, Calif., assignor to Bobrick Washroom Equipment Corporation, North Hollywood, Calif.
Filed Apr. 1, 1983, Ser. No. 432,304
Term of patent 14 years
U.S. Cl. D6—545

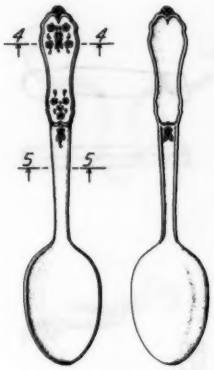
280,168
BEDSPREAD
Louis Hornick, II, and Morton Hornick, both of New York, N.Y., assignors to Louis Hornick & Co., Inc., New York, N.Y.
Filed Jan. 13, 1983, Ser. No. 457,719
Term of patent 14 years
U.S. Cl. D6—603



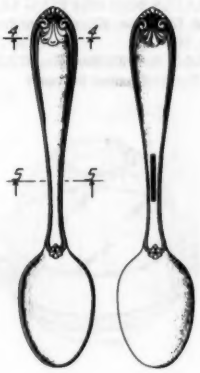
280,169
MATTRESS COVER
Robert T. Henry, 44 Clarendon Dr., Durban North 4051, South Africa
Filed Sep. 6, 1983, Ser. No. 529,887
Claims priority, application South Africa, Mar. 25, 1983, 830268
Term of patent 14 years
U.S. Cl. D6—603

280,170
COMBINED BEACH TOWEL AND PILLOW
Donald G. Short, 5455 Third Ave., Fort Myers, Fla. 33907
Filed Aug. 5, 1982, Ser. No. 405,620
Term of patent 14 years
U.S. Cl. D6—608

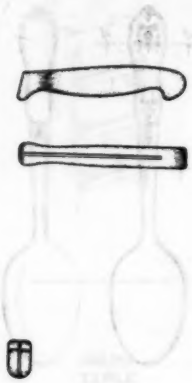
280,171
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Apr. 11, 1983, Ser. No. 483,864
Term of patent 14 years
U.S. Cl. D7—137



280,172
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed May 20, 1983, Ser. No. 496,417
Term of patent 14 years
U.S. Cl. D7—137

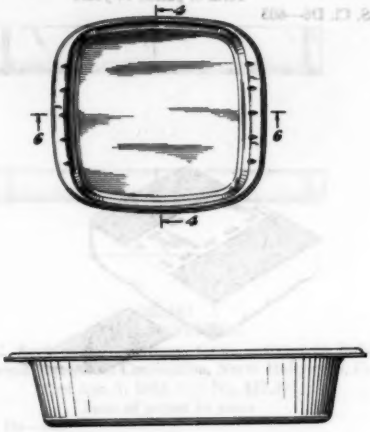


280,173
HANDLE FOR A KNIFE
Robert R. Welch, Chipping Campden, England, assignor to Wilkinson Sword Limited, High Wycombe, England
Filed Nov. 12, 1981, Ser. No. 320,649
Claims priority, application United Kingdom, May 16, 1981, 1000520
Term of patent 14 years
U.S. Cl. D7—152

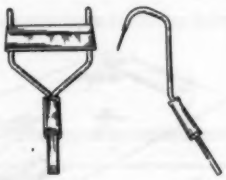


280,174
APPARATUS FOR POPPING CORN
William C. Cesaroni, Glenview, Ill., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 8, 1983, Ser. No. 473,297
Term of patent 14 years
U.S. Cl. D7—325

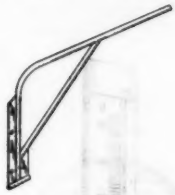
280,175
CASSEROLE
Howard D. Bassett, Downers Grove, Ill., assignor to Union Carbide Corporation, Danbury, Conn.
Filed Mar. 31, 1983, Ser. No. 483,003
Term of patent 14 years
U.S. Cl. D7—354



280,176
GARDENING IMPLEMENT
Walter Kolb, Betzdorf, Fed. Rep. of Germany, assignor to Wolf-Gerate GmbH, Fed. Rep. of Germany
Division of Ser. No. 383,155, May 28, 1982, Pat. No. Des. 276,974. This application Oct. 18, 1984, Ser. No. 663,461
Term of patent 14 years
U.S. Cl. D8—11



280,177
VEHICLE BODY REPAIR BAR
Kenneth P. Johnson, Rte. 12, Box 24, Frenchtown, N.J. 08825
Filed May 3, 1982, Ser. No. 373,855
Term of patent 14 years
U.S. Cl. D8—88

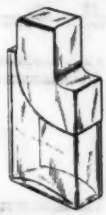


280,178
POCKET KNIFE
Manfred Lang, Wuppertal, Fed. Rep. of Germany, assignor to Wilkinson Sword GmbH, Solingen, Fed. Rep. of Germany
Filed Sep. 26, 1983, Ser. No. 535,970
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 5 MR 9354
Term of patent 14 years
U.S. Cl. D8—99

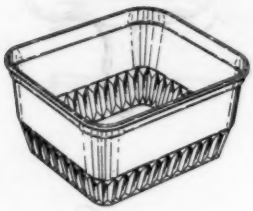
280,179
FOLDING KNIFE
Philip V. Miceli, 1900 Shanklin Ave., Baltimore, Md. 21204
Filed Apr. 11, 1984, Ser. No. 598,961
Term of patent 14 years
U.S. Cl. D8—99

280,180
TWISTING FASTENER
David A. Burt, Wokingham, England, assignor to ITW Limited, Windsor, England
Filed Oct. 21, 1983, Ser. No. 544,292
Claims priority, application United Kingdom, Apr. 26, 1983, 1012696
Term of patent 14 years
U.S. Cl. D8—394

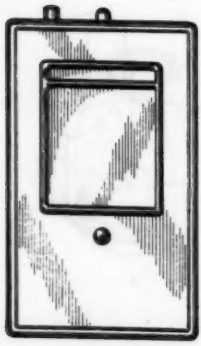
280,181
BOTTLE
Jean P. Vitrac, Paris, France, assignor to Hanorah Italiana S.p.A., Milan, Italy
Filed Mar. 29, 1983, Ser. No. 466,211
Term of patent 14 years
U.S. Cl. D9—375



280,182
PACKAGING CONTAINER
Frank S. Tyler, Kent, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Jan. 11, 1983, Ser. No. 457,306
Claims priority, application United Kingdom, Jul. 16, 1982, 1007780
Term of patent 14 years
U.S. Cl. D9—425

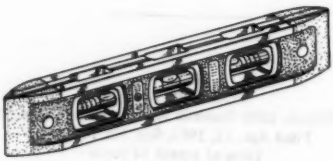


280,183
MINI-GEIGER-COUNTER
Claus J. Braun, Feldbergstrasse 8, 6056 Heusenstamm, Fed. Rep. of Germany
Filed Sep. 23, 1982, Ser. No. 422,326
Term of patent 14 years
U.S. Cl. D10—46



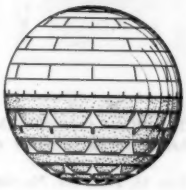
280,184
THERMOMETER
Walter Henkels, Holunderweg 1, D-5142 Hückelhoven, Fed. Rep. of Germany
Filed May 4, 1983, Ser. No. 491,457
Claims priority, application Hague, Jan. 10, 1983, DM/002 126
Term of patent 14 years
U.S. Cl. D10—58

280,185
LEVEL
Randall J. Wright, 2000 Moraine End, Delafield, Wis. 53018
Filed Jan. 31, 1983, Ser. No. 462,529
Term of patent 14 years
U.S. Cl. D10—69



280,186
LEVELING GAGE
Gregory L. Cross, and Wendell C. Cross, both of 11413 W. 48th Ave., Wheatridge, Colo. 80033
Filed Apr. 18, 1983, Ser. No. 485,722
Term of patent 14 years
U.S. Cl. D10—69

280,187
ATTITUDE-DIRECTOR INDICATOR
Lennart K. Nordström, Linköping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden
Filed Jun. 30, 1983, Ser. No. 509,364
Claims priority, application Sweden, Jan. 7, 1983, 83-0047
Term of patent 14 years
U.S. Cl. D10—74



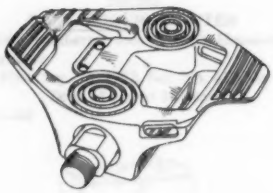
280,188
STAR JEWELRY ORNAMENT OR THE LIKE
Alan Y. T. Lee, 24 Ferncliff Rd., Coscob, Conn. 06807
Filed Mar. 11, 1983, Ser. No. 474,706
Term of patent 14 years
U.S. Cl. D11—70

280,189
PENDANT CONTAINING TEMPERATURE SENSITIVE MATTER
Paul J. Moses, and Paula B. Moses, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed May 13, 1983, Ser. No. 494,472
Term of patent 14 years
U.S. Cl. D11—79

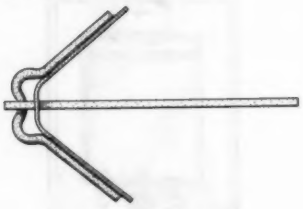
280,190
FIGURINE OF A BABY ORCA
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jan. 17, 1983, Ser. No. 458,296
Term of patent 14 years
U.S. Cl. D11—158

280,191
FIGURINE OF A RISING UNICORN
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Urugnay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Sep. 15, 1983, Ser. No. 532,459
Term of patent 14 years
U.S. Cl. D11—159

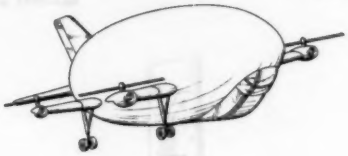
280,192
PEDAL FOR A BICYCLE
Satoshi Watanabe, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed May 4, 1982, Ser. No. 374,745
Claims priority, application Japan, Nov. 16, 1981, 56-51076
Term of patent 14 years
U.S. Cl. D12—125



280,193
BOAT ANCHOR
William F. Spanner, Retriever Lodge, Tudor Close, Seaford, E. Sussex BN25 2LU, England
Filed May 27, 1983, Ser. No. 498,703
Term of patent 14 years
U.S. Cl. D12—215

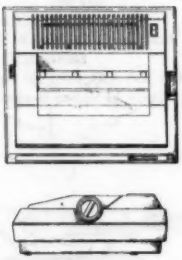


280,194
AIRCRAFT
Hans J. Bothe, 14 Erdelsweiher, 5475 Burgbrohl, Fed. Rep. of Germany
Filed Feb. 28, 1983, Ser. No. 470,314
Term of patent 14 years
U.S. Cl. D12—323

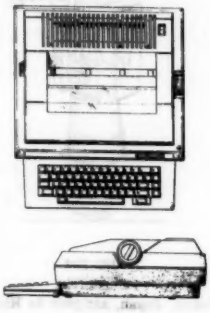


280,195
DIMMER SWITCH FOR A LAMP OR SIMILAR ARTICLE
Lynn Roszel, Richardson, Tex., assignor to Prescolite, San Leandro, Calif.
Filed Feb. 16, 1983, Ser. No. 466,917
Term of patent 14 years
U.S. Cl. D13—32

280,196
TELEPRINTER CABINET
Donald M. Genaro, Haworth; Alvin R. Tilley, Red Bank, both of N.J.; Alfred Z. Purzycki, Arlington Heights, Ill.; Raymond R. Seidlitz, Lincolnshire, Ill., and Eugene K. Sokolowski, Chicago, Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.
Filed May 20, 1983, Ser. No. 496,361
Term of patent 14 years
U.S. Cl. D14—93

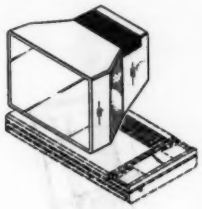


280,197
COMBINED TELEPRINTER CABINET AND STAND-ALONE KEYBOARD ENCLOSURE
Donald M. Genaro, Haworth; Alvin R. Tilley, Red Bank, both of N.J.; Alfred Z. Purzycki, Arlington Heights, Ill.; Raymond R. Seidlitz, Lincolnshire, Ill., and Eugene K. Sokolowski, Chicago, Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.
Filed May 20, 1983, Ser. No. 496,362
Term of patent 14 years
U.S. Cl. D14—93

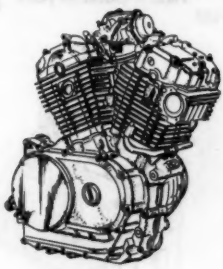


280,198
DESKTOP COMPUTER SYSTEM
Richard R. Dillon, Wellesley; David G. Kmetz, Newton, and Edward J. Cesarczyk, Waltham, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.
Filed Feb. 23, 1983, Ser. No. 468,915
Term of patent 14 years
U.S. Cl. D14—100

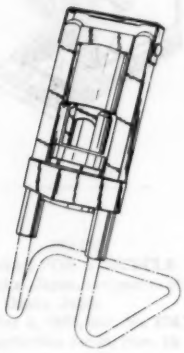
280,199
DISPLAY TERMINAL
Desmond J. Ryan, Ottawa, Canada, assignor to Northern Telecom Limited, Quebec, Canada
Filed Feb. 8, 1983, Ser. No. 465,003
Claims priority, application Canada, Oct. 29, 1982, 29-10-82-6
Term of patent 14 years
U.S. Cl. D14—113



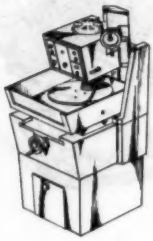
280,200
ENGINE FOR MOTORCYCLE
Masato Iwakura, Asaka; Mutsuo Hirose, and Yoshiyuki Yamada, both of Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 17, 1982, Ser. No. 450,730
Claims priority, application Japan, Jun. 22, 1982, 57-28098
Term of patent 14 years
U.S. Cl. D15—1



280,201
HOSE ASSEMBLY CRIMPING MACHINE
Luis Moreiras, Mentor, and George C. Burrington, Eastlake, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Dec. 21, 1983, Ser. No. 564,109
Term of patent 14 years
U.S. Cl. D15—123



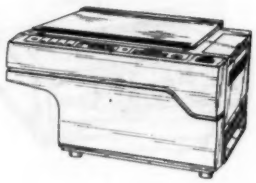
280,202
GRINDING MACHINE
Rufus W. Aldridge, Jr., Huntsville, Ala., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.
Filed Dec. 22, 1983, Ser. No. 564,505
Term of patent 14 years
U.S. Cl. D15—124



280,203
INDUSTRIAL ROBOT
Masato Shibayama, Sayama; Takeshi Abe; Kiyohide Koizumi, both of Tokyo; Kouichi Sugimoto, Hiratsuka; Hitoshi Kusakawa, Funabashi, and Tatenori Jinriki, Narashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 5, 1983, Ser. No. 482,189
Claims priority, application Japan, Oct. 15, 1982, 57-46555
Term of patent 14 years
U.S. Cl. D15—199

280,204
CAMERA
Koichi Soda, Tokyo, Japan, assignor to Ricoh Company Ltd., Japan
Filed Jun. 27, 1983, Ser. No. 508,461
Claims priority, application Japan, Dec. 28, 1982, 57-059366
Term of patent 14 years
U.S. Cl. D16—8

280,205
ELECTRONIC COPYING MACHINE
Tooru Okuyama, Isehara; Kunio Hara, Chiba, and Kiyoshi Fujii, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jul. 1, 1983, Ser. No. 510,246
Claims priority, application Japan, Jan. 20, 1983, 58-1527
Term of patent 14 years
U.S. Cl. D16—31



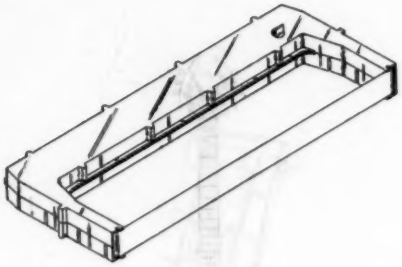
280,206
CONNECTOR FOR ENDOSCOPE
Fumiaki Ishii, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Japan
Filed Oct. 8, 1982, Ser. No. 433,517
Claims priority, application Japan, Apr. 14, 1982, SHO/57-16276
Term of patent 14 years
U.S. Cl. D16—134

280,207
GUITAR
William H. Edwards, 8890 56th St., Temple Terrace, Fla. 33617
Filed Apr. 19, 1983, Ser. No. 486,558
Term of patent 14 years
U.S. Cl. D17—18

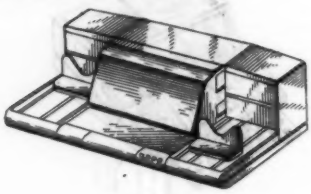
280,208
GUITAR
William H. Edwards, 8890 56th St., Temple Terrace, Fla. 33617
Filed Apr. 19, 1983, Ser. No. 486,557
Term of patent 14 years
U.S. Cl. D17—19

280,209
ELECTRONIC PRINTING CALCULATOR
Masaji Sawada; Shigeaki Hayashi; Hiroshi Sakaguchi, and Kazuo Yamada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 23, 1982, Ser. No. 452,430
Claims priority, application Japan, Jul. 5, 1982, 57-30408
Term of patent 14 years
U.S. Cl. D18—7

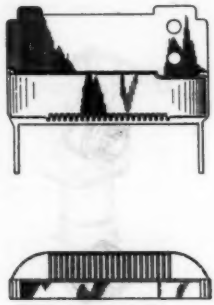
280,210
INK RIBBON CARTRIDGE
Gilbert A. Ledoux, East Taunton, Mass., assignor to Litton Systems, Inc., Fall River, Mass.
Filed Jun. 13, 1983, Ser. No. 503,444
Term of patent 14 years
U.S. Cl. D18—12



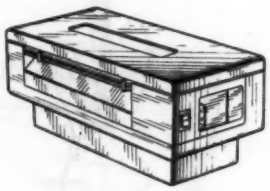
280,211
ADDRESSING PRINTING SYSTEM OR SIMILAR ARTICLE
John W. Overman, Phoenix, Ariz., and Jerry J. Kosner, La Grange, Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Jun. 1, 1983, Ser. No. 500,056
Term of patent 14 years
U.S. Cl. D18—13



280,212
RIBBON CASSETTE OR SIMILAR ARTICLE
Thomas J. Bossack; Louis E. Shipos, and Frederick M. Brown, all of Ithaca, N.Y., assignors to NCR Corporation, Dayton, Ohio
Filed May 9, 1983, Ser. No. 492,525
Term of patent 14 years
U.S. Cl. D18—22



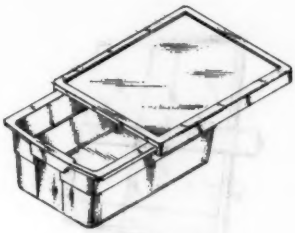
280,213
BURSTER OR SIMILAR ARTICLE
Andrew L. Alger, Wilmette, Ill., assignor to Goldsmith, Yamasaki, Specht Inc., Chicago and Uarco Incorporated, Barrington, both of, Ill.
Filed Feb. 3, 1983, Ser. No. 463,530
Term of patent 14 years
U.S. Cl. D18—34



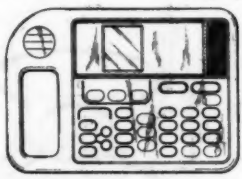
280,214
CREDIT CARD
George E. Opel, 4031 Kottler Dr., Lafayette Hill, Pa. 19444
Filed Apr. 7, 1983, Ser. No. 482,787
Term of patent 14 years
U.S. Cl. D19—10

280,215
COMBINED PEN, WATCH AND TIRE PRESSURE GAUGE
Tien Tsai Huang, No. 4, 30 La., Wu-Chuan St., Pan-Chiao City, Taipei, Taiwan
Filed Feb. 16, 1983, Ser. No. 466,929
Term of patent 14 years
U.S. Cl. D19—36

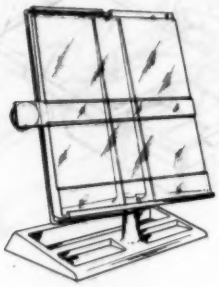
280,216
CHILD'S LAP DESK AND BLACKBOARD
Carl J. Boklund, Concord, N.H., assignor to James Wilcoxen, Concord, N.H.
Filed Feb. 25, 1983, Ser. No. 469,639
Term of patent 14 years
U.S. Cl. D19—52



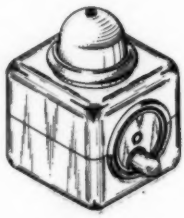
280,217
TALKING MATHEMATICS TRAINER
Hisashi Tomozawa; Yoshihiko Nagao, and Shigeru Saito, all of Kanagawa, Japan, assignors to Nitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 4, 1983, Ser. No. 472,343
Claims priority, application Japan, Oct. 8, 1982, 57-45924
Term of patent 14 years
U.S. Cl. D19—60



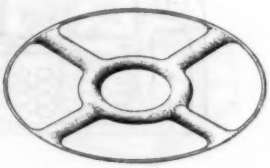
280,218
TYPIST'S COPY STAND
Michael J. Szablak, and Glen E. Tomblin, both of Winchester, Va., assignors to Rubbermaid Commercial Products, Inc., Winchester, Va.
Filed Jul. 12, 1982, Ser. No. 397,513
Term of patent 14 years
U.S. Cl. D19—91



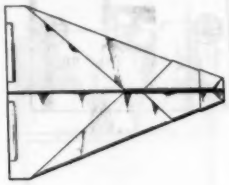
280,219
TOY JACK IN THE BOX
Ikuo Suzuki, Urawa, Japan, assignor to Tomy Kogyo Company, Incorporated, Japan
Filed May 24, 1982, Ser. No. 381,041
Claims priority, application Japan, Nov. 5, 1981, 56-48983
Term of patent 14 years
U.S. Cl. D21—59



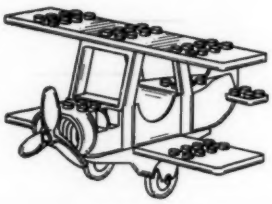
280,220
BOOMERANG
Marshall R. Blight, Nedlands, Australia, assignor to Emeraldine Limited, London, England
Filed Oct. 28, 1982, Ser. No. 437,320
Claims priority, application Australia, Apr. 29, 1982, 0242/82
Term of patent 14 years
U.S. Cl. D21—85



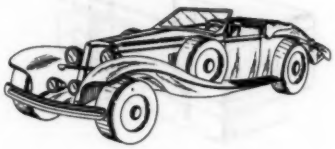
280,221
TOY AIRPLANE
Robert J. Hoge, IV, Rte. 1, Box 198B, Jasper, Tenn. 37347
Filed Jun. 10, 1983, Ser. No. 503,362
Term of patent 14 years
U.S. Cl. D21—89



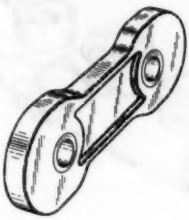
280,222
TOY AIR PLANE
Erik P. Tapdrup, Virum, and Gert P. Olsen, Lyngby, both of Denmark, assignors to Interlego AG, Switzerland
Filed Dec. 15, 1983, Ser. No. 561,666
Term of patent 14 years
U.S. Cl. D21—90



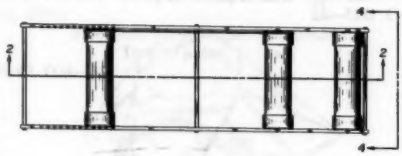
280,223
EXTENDABLE TOY CAR OR SIMILAR ARTICLE
Michael W. Barbato, Hermosa Beach; Ray W. Mattson, Venice, and Michael R. Nordgren, Huntington Beach, all of Calif., assignors to Mattel, Inc., Racine, Wis.
Filed Mar. 10, 1983, Ser. No. 474,063
Term of patent 14 years
U.S. Cl. D21—136



280,224
VARIABLE RESISTANCE STRAP FOR EXERCISE APPARATUS
Jerry L. Wilson, Beaverton, Oreg., assignor to Soloflex, Inc., Hillsboro, Oreg.
Filed Feb. 15, 1983, Ser. No. 466,439
Term of patent 14 years
U.S. Cl. D21—191



280,225
BICYCLE EXERCISE SUPPORT
James P. Eagle, 4716 Lillie, Fort Wayne, Ind. 46806
Filed Mar. 9, 1983, Ser. No. 473,728
Term of patent 14 years
U.S. Cl. D21—191



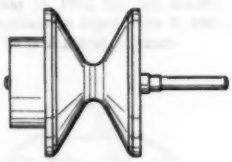
280,226
EXERCISE CYCLE
John A. Kasuba, Germantown; John T. Kanne; Sajjan S. Dhaliwal, both of Memphis, all of Tenn.; Norman Gold, Brooklyn, N.Y., and John Weiss, St. Louis, Mo., assignors to Allegheny International Exercise Co., Lincolnton, N.C.
Filed Jan. 28, 1983, Ser. No. 461,908
Term of patent 14 years
U.S. Cl. D21—194

280,227
EXERCISE CYCLE
Robert D. LaMarsh, Alton, Ill., and John Weiss, St. Louis, Mo., assignors to Perfection Manufacturing Company, St. Louis, Mo.
Filed Apr. 28, 1983, Ser. No. 490,068
Term of patent 14 years
U.S. Cl. D21—194

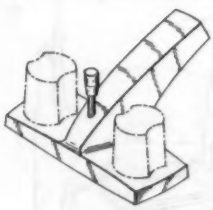
280,228
EXERCISE CYCLE
Norman Gold, Brooklyn, N.Y., assignor to Allegheny International Exercise Co., Lincolnton, N.C.
Filed Aug. 9, 1983, Ser. No. 521,520
Term of patent 14 years
U.S. Cl. D21—194

280,229
CLEANER FOR A GOLF CLUB HEAD
Donald G. Parent, 3416 Brace, Burbank, Calif. 91504
Filed Apr. 12, 1983, Ser. No. 484,200
Term of patent 14 years
U.S. Cl. D21—234

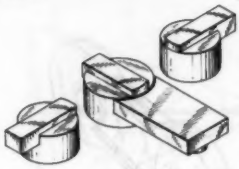
280,230
SPOOL FOR A FISHING REEL
Yoshiyuki Matsui, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Filed Feb. 10, 1983, Ser. No. 465,413
Term of patent 14 years
U.S. Cl. D22—25



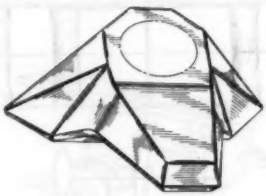
280,231
SANITARY FAUCET
James E. Niemann, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 169,538, Jul. 17, 1980,. This application Feb. 7, 1983, Ser. No. 464,535
Term of patent 14 years
U.S. Cl. D23—25



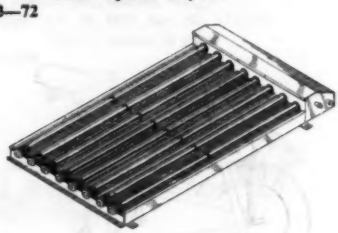
280,232
FAUCET SET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Apr. 25, 1983, Ser. No. 488,577
Term of patent 14 years
U.S. Cl. D23—25



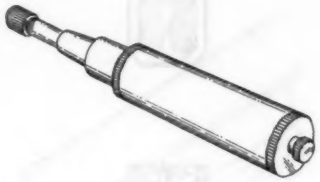
280,233
LAVATORY FAUCET SHELL
Gary A. Fleischmann, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Nov. 16, 1983, Ser. No. 552,311
Term of patent 14 years
U.S. Cl. D23—32



280,234
SOLAR ENERGY COLLECTOR OR THE LIKE
Hirosato Takeuchi, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohiki Co., Ltd., Tokyo, Japan
Filed Nov. 22, 1982, Ser. No. 443,651
Claims priority, application Japan, Mar. 24, 1982, 57-22317
Term of patent 14 years
U.S. Cl. D23—72

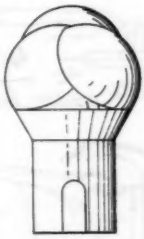


280,235
FLASK-SUPPORTABLE STIRRER DRIVE UNIT
Lawrence M. Street, Morley, England, assignor to Hy-Per-Graph Limited, Park Field Mills, England
Filed Jul. 9, 1982, Ser. No. 396,957
Claims priority, application United Kingdom, Apr. 23, 1982, 1006352
Term of patent 14 years
U.S. Cl. D24—8



280,236
EYE FOR TAXIDERMY
John W. Crossley, Box 434, Geigel Hill Rd., Upper Black Eddy, Pa. 18972
Filed Mar. 28, 1983, Ser. No. 479,353
Term of patent 14 years
U.S. Cl. D24—33

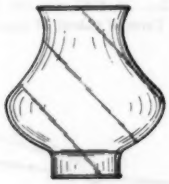
280,237
BUILDING FOR THE SELLING OF ICE CREAM
Michael B. Gaumer, 381 Getchell Ave., Grayslake, Ill. 60030
Filed Jan. 31, 1983, Ser. No. 463,401
Term of patent 14 years
U.S. Cl. D25—10



280,238
MINIATURE LIGHT BULB
Merril Herrnanson, Palm Beach, Fla., assignor to Mr. Christmas Incorporated, New York, N.Y.
Filed May 18, 1983, Ser. No. 495,710
Term of patent 14 years
U.S. Cl. D26—2

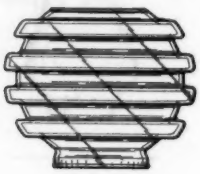
280,239
SHADE FOR LIGHT FIXTURES
Kenneth A. Burket, Horseheads, and Gerhard F. Koenig, Corning both of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Jun. 20, 1983, Ser. No. 505,692
Term of patent 14 years
U.S. Cl. D26—132

280,240
SHADE FOR LIGHT FIXTURES
Kenneth A. Burket, Horseheads; Gerhard F. Koenig, Corning both of N.Y., and Richard L. Maxwell, Sr., Nutley, N.J., assignors to Corning Glass Works, Corning, N.Y.
Filed Jun. 20, 1983, Ser. No. 505,694
Term of patent 14 years
U.S. Cl. D26—132

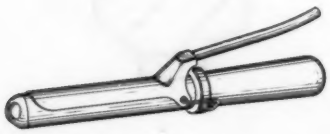


280,241
CHIMNEY FOR LIGHT FIXTURES OR THE LIKE
Kenneth A. Burket, Horseheads; Gerhard F. Koenig, Corning, and Jay Moss, Cedarhurst, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Jun. 20, 1983, Ser. No. 505,695
Term of patent 14 years
U.S. Cl. D26—132

280,242
GLOBE OR THE LIKE
Kenneth A. Burket, Horseheads; Gerhard F. Koenig, Corning, and Jay Moss, Cedarhurst, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Apr. 13, 1983, Ser. No. 484,498
Term of patent 14 years
U.S. Cl. D26—134



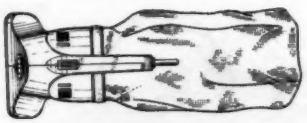
280,243
CURLER/STYLER
Farees U. Khaja, Chicago, Ill., assignor to John Zink Company, Tulsa, Okla.
Filed Jun. 23, 1983, Ser. No. 507,195
Term of patent 14 years
U.S. Cl. D28—35

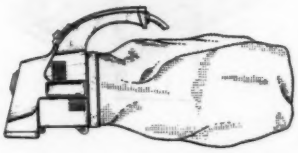


280,244
DUAL PRESSED POWDER COMPACT
Marcel Buchet, Paris, France, assignor to L'Oreal, S.A., Paris, France
Filed Mar. 24, 1983, Ser. No. 478,277
Term of patent 14 years
U.S. Cl. D28—78

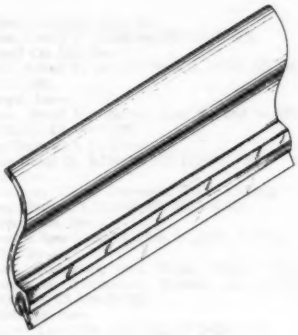
280,245
TRIO PRESSED POWDER COMPACT
Marcel Buchet, Paris, France, assignor to L'Oreal, S.A., Paris, France
Filed Mar. 24, 1983, Ser. No. 478,278
Term of patent 14 years
U.S. Cl. D28—78

280,246
HAND VACUUM
Robert M. Smith, Copley, Ohio, assignor to Royal Appliance Mfg. Co., Highland Hts, Ohio
Filed Aug. 26, 1983, Ser. No. 526,686
Term of patent 14 years
U.S. Cl. D32—18



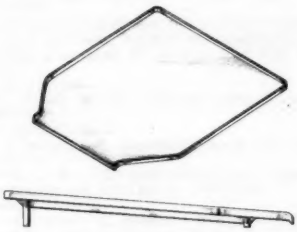


280,247
SQUEEGEE
David A. Jones, Kettering, Ohio, assignor to The Drackett Company, Del.
Filed Jan. 10, 1983, Ser. No. 457,320
Term of patent 14 years
U.S. Cl. D32—41



280,248
BRUSH
Harold W. Hanson, Jr., Newport Beach, Calif., assignor to An-Teak-Qua Company, Newport Beach, Calif.
Filed Aug. 1, 1983, Ser. No. 518,819
Term of patent 14 years
U.S. Cl. D32—50

280,249
DRAINBOARD
William P. Martin, Rte. 2, Box 202D, York, S.C. 29745
Filed Jun. 4, 1982, Ser. No. 384,932
Term of patent 14 years
U.S. Cl. D32—56



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF AUGUST, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Keenan, Robert E., 4,536,386, Cl. 424-10.000.

A. T. Newell Co. Inc.: *See*—
Newell, Alfred T., Jr.; and Newell, Alfred T., III, 4,535,601, Cl. 62-171.000.

AB Carbogel: *See*—
Hansen, Bertil V.; Kelfve, Sten S.; and Mollberg, Henri R., 4,536,187, Cl. 44-51.000.

AB Spray Technics S.T.: *See*—
Janson, Bengt G., 4,536,295, Cl. 210-804.000.

Ab Thoreb: *See*—
Brynielsson, Thore; Tomasson, Tom; Ahlberg, Leif; and Johansson, Magnus, 4,536,004, Cl. 280-166.000.

Abex Corporation: *See*—
Khandros, Igor Y.; and Larson, Hugo R., 4,536,232, Cl. 148-35.000.

Abo, Keiju: *See*—
Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,536,171, Cl. 474-28.000.

Abu Aktiebolag: *See*—
Carlsson, Lars-Olof, 4,535,952, Cl. 242-84.20G.

Accupac, Inc.: *See*—
Powers, Richard, 4,535,823, Cl. 141-5.000.

Ace Glass Incorporated: *See*—
Riley, Larry T., 4,535,969, Cl. 251-215.000.

Ace, Marshall E., Jr., deceased (by Ramsey, David L., executor); Mattson, Ray W.; and Wittenberg, Mark S., to Mattel, Inc. Child's playset. 4,536,162, Cl. 446-102.000.

Aceto, Roger, to Union Carbide Corporation. Expandable casing sizing mechanism and method. 4,535,508, Cl. 17-49.000.

Adachi, Keiichi: *See*—
Kato, Hirohiko; Ichijima, Seiji; Adachi, Keiichi; and Watanabe, Toshiyuki, 4,536,472, Cl. 430-505.000.

Adam, William S.: *See*—
DePasquale, Michael; and Adam, William S., 4,536,756, Cl. 340-626.000.

Adams, C. Harris; and Farnsworth, Robert P., to Celedata Corporation. Time accounting system. 4,536,646, Cl. 235-377.000.

Adelaide & Wallaroo Fertilizers Ltd.: *See*—
Walter, Karl H., 4,535,550, Cl. 34-33.000.

Adlerstein, Michael G., to Raytheon Company. Semiconductor structures and manufacturing methods. 4,536,469, Cl. 430-314.000.

Adret Electronique: *See*—
Charbonnier, Roger, 4,536,721, Cl. 331-116.00R.

Adriaensen, Ludovicus C. M.: *See*—
Blanchart, Alain P. O.; and Adriaensen, Ludovicus C. M., 4,536,272, Cl. 204-294.000.

Advanced Semiconductor Products, Inc.: *See*—
Winn, Ray, 4,536,240, Cl. 156-74.000.

AE PLC: *See*—
Collyear, John G.; and Parker, David A., 4,535,682, Cl. 92-153.000.

Aeroquip Corporation: *See*—
VerPlanck, James A., 4,535,521, Cl. 29-235.000.

Agarwal, Pawan K.; Lundberg, Robert D.; Graessley, William W.; and Ver Strate, Gay, to Exxon Research and Engineering Co. Hydrocarbon based gels and solutions of blends of sulfonate ionomers and their precursors extended over critical regions. 4,536,310, Cl. 252-33.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Kirstein, Fritz, 4,536,015, Cl. 283-91.000.

AGFA-Gevaert N.V.: *See*—
De Schamphelaere, Lucien A.; De Cock, Etienne M.; De Bondt, Werner E.; Librecht, Freddy M.; Boeve, Gerard J.; and Van Peteghem, Willy F., 4,536,778, Cl. 346-160.000.

Ahiskali, Serhat M., to AT&T Bell Laboratories. Snap-in bus bar. 4,536,826, Cl. 361-407.000.

Ahlberg, Leif: *See*—
Brynielsson, Thore; Tomasson, Tom; Ahlberg, Leif; and Johansson, Magnus, 4,536,004, Cl. 280-166.000.

Ahola, Clifford J.: *See*—
Brubaker, Ronald L.; Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; Boyle, Frederick P.; Parkinson, Truman D.; and Rine, James C., 4,535,941, Cl. 241-21.000.

Aida, Hiroyuki: *See*—
Narita, Ryuhei; Aida, Hiroyuki; and Kamiya, Yoshinori, 4,535,503, Cl. 16-382.000.

Air Products and Chemicals, Inc.: *See*—
Allam, Rodney J.; and Prentice, Alan L., 4,535,594, Cl. 60-654.000.
Deeba, Michael, 4,536,602, Cl. 564-485.000.

Airheart, Franklin B., to Alston Industries, Inc. Compact high performance disc brake. 4,535,873, Cl. 188-72.400.

Aisin Seiki Kabushiki Kaisha: *See*—
Kodama, Hisashi; Hamamoto, Tooru; Tamura, Tetsuomi; Sato, Katsujiro; and Yamada, Kazuharu, 4,535,734, Cl. 123-90.580.
Ohumi, Takeharu; Kurahashi, Yasuo; Hattori, Kyo; and Sakurai, Kazuhiro, 4,535,815, Cl. 137-625.480.

Aiuchi, Susumu: *See*—
Kubota, Hitoshi; Tanaka, Minoru; and Aiuchi, Susumu, 4,536,419, Cl. 427-255.500.

Ajinomoto Co., Inc.: *See*—
Sakakibara, Shumpei; Yugari, Yasumi; and Hashimoto, Shigebumi, 4,536,395, Cl. 514-7.000.

Akademie der Wissenschaften der DDR: *See*—
Loth, Fritz; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,536,217, Cl. 106-122.000.

Akagi, Noriyuki: *See*—
Ogawa, Yoshinari; and Akagi, Noriyuki, 4,536,531, Cl. 524-135.000.

Akaike, Akihiko: *See*—
Yasui, Toshihiko; Matsumoto, Tetsuo; and Akaike, Akihiko, 4,536,468, Cl. 430-296.000.

Akiyama, Yasuko: *See*—
Nara, Michiko; Yamazaki, Kazunori; and Akiyama, Yasuko, 4,536,405, Cl. 514-781.000.

Aktiebolaget Electrolux: *See*—
Berglund, Lars G.; Bjorklund, Sven-Erik B.; and Linde, Lars H., 4,536,043, Cl. 312-222.000.

Aktiebolaget SKF: *See*—
Lachonius, Leif, 4,535,963, Cl. 248-251.000.

Aktiengesellschaft Adolph Saurer: *See*—
Kuhnis, Ernst; Kobler, Armin; Schreiber, Max; and Wallimann, Hans, 4,535,709, Cl. 112-83.000.

Akzo N.V.: *See*—
Freese, Karl-Heinz; and Munch, Hans-Jurgen, 4,536,525, Cl. 523-414.000.

Albrecht, Johannes; Jakobs, Rudolf; Turna, Osman; Vierrath, Helmut; Weil, Manfred; and Zapke, Klaus, to Metallgesellschaft Aktiengesellschaft. Stirrer of a reactor for gasifying solid fuels. 4,536,193, Cl. 48-77.000.

Albright, Larry E.: *See*—
Mather, Joseph M.; and Albright, Larry E., 4,535,868, Cl. 180-297.000.

Alexander, David C.: *See*—
Lin, Jiang-Jen; and Alexander, David C., 4,536,604, Cl. 585-601.000.

Alexander, Robert H., to Rockwell International Corporation. Power-operated fastener tool. 4,535,850, Cl. 173-12.000.

Alexeev, Alexei I.: *See*—
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Alfa-Laval Separation AB: *See*—
Karlsson, Per G., 4,536,285, Cl. 210-96.100.

Alfa Romeo Auto S.p.A.: *See*—
Banfi, Ambrogio, 4,535,731, Cl. 123-90.150.

Alfing Kessler Sondermaschinen GmbH: *See*—
Fischer, Peter; and Schubert, Paul, 4,535,527, Cl. 29-568.000.

Allam, Rodney J.; and Prentice, Alan L., to Air Products and Chemicals, Inc. Method and apparatus for generating power and low pressure saturated or near saturated steam. 4,535,594, Cl. 60-654.000.

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Allen, Richard M.; Arnold, Jeffrey M.; Field, Joseph J.; and Spraker, Terry E., 4,536,770, Cl. 346-29.000.

Allen, Dillis V. Rocker engine. 4,535,730, Cl. 123-78.00F.

Allen Manufacturing Company: *See*—
Molinari, Paul J., 4,535,658, Cl. 81-177.850.

Allen, Richard B., to General Electric Company. Method for altering the surface of thermoplastic polymers. 4,536,542, Cl. 525-67.000.

Allen, Richard M.; Arnold, Jeffrey M.; Field, Joseph J.; and Spraker, Terry E., to Allen Datagraph Incorporated; and Datascope Corporation. Reverse side marking plotter/printer pad. 4,536,770, Cl. 346-29.000.

Allen, Webster F. Trash storing apparatus. 4,536,033, Cl. 298-2.000.

Allied Corporation: *See*—
Averill, John A., 4,535,522, Cl. 29-280.000.
Chlanda, Frederick P.; and Mani, Krishnamurthy N., 4,536,269, Cl. 204-182.400.
Kavesh, Sheldon; and Prevorsek, Dusan C., 4,536,536, Cl. 524-462.000.
Reichardt, Manfred; and Schutzle, Gunter, 4,536,045, Cl. 339-14.00P.

Schildkraut, Alan L.; and MacAvoy, David W., 4,536,048, Cl. 339-89.00M.
Shealy, James B., 4,535,663, Cl. 83-100.000.
Allington, Robert W., to ISCO, Inc. Absorbance monitor. 4,536,091, Cl. 356-435.000.
Alsenz, Richard H.; and Ansted, Roger C., to Alsenz, Richard H. Shift logic control apparatus for unequal capacity compressors in a refrigeration system. 4,535,602, Cl. 62-175.000.
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Romand-Monnier, Jacques; and Lejeune, Jean-Pierre, 4,536,138, Cl. 417-422.000.
Alston Industries, Inc.: *See—*
Airheart, Franklin B., 4,535,873, Cl. 188-72.400.
Alternative Pioneering Systems Inc.: *See—*
Erickson, Chad S., 4,536,643, Cl. 219-400.000.
Altman Stage Lighting Co., Inc.: *See—*
Lemons, Thomas M., 4,536,832, Cl. 362-264.000.
Amco Corporation: *See—*
Bentson, Wade A., 4,535,688, Cl. 99-353.000.
Amemiya, Yoichi: *See—*
Kozai, Yoshinori; Amemiya, Yoichi; and Asahara, Sunao, 4,536,649, Cl. 250-231.0SE.
Amendola, Albert; Christensen, Richard G.; and Yereance, John G., Jr., to International Business Machines Corporation. Method and apparatus for making a mask conforming to a ceramic substrate metallization pattern. 4,536,470, Cl. 430-314.000.
American Can Company: *See—*
Ebben, Gerald J., 4,535,615, Cl. 72-39.000.
Farrell, Christopher J.; and Tsai, Boh C., 4,536,409, Cl. 426-398.000.
American Cyanamid Company: *See—*
Floyd, Middleton B., Jr.; and Goidl, Jo A., 4,536,517, Cl. 514-576.000.
Lawhorne, Earl R., 4,536,268, Cl. 204-182.400.
Savides, Christos; and Bright, John H., 4,536,596, Cl. 562-443.000.
Schmitt, Joseph M., 4,536,326, Cl. 252-400.00R.
Shepherd, Robert G.; and Upeslacis, Janis, 4,536,346, Cl. 260-465.00D.
Zoltan, Bart J., 4,535,782, Cl. 128-665.000.
Zwick, Maurice M., 4,536,365, Cl. 264-558.000.
American Orthodontics Corporation: *See—*
Garton, Robert E., Jr.; and Viglietti, John E., 4,536,154, Cl. 433-8.000.
American Screen Printing Equipment Company: *See—*
Lala, Louis A.; and Frenchy, James H., 4,535,549, Cl. 34-4.000.
American Standard Inc.: *See—*
Gerken, Carl F., 4,535,578, Cl. 52-243.100.
Gilcher, Heinz, 4,535,959, Cl. 246-34.00R.
Gray, David A.; and Webb, Donald O., 4,535,838, Cl. 165-134.00R.
AMP Incorporated: *See—*
Kandybowski, Steven J.; and Sucheski, Matthew M., 4,536,055, Cl. 339-258.00R.
Ampex Corporation: *See—*
Louth, Kenneth, 4,536,806, Cl. 360-69.000.
Amstutz, Gary A.; and Mayekar, Kishor D., to Union Carbide Corporation. Fluorescent corrosive fluoride solution. 4,536,322, Cl. 252-301.160.
Ancet Corporation: *See—*
Kitrilakis, Sotiris; and Johnson, Theodore R., 4,535,778, Cl. 128-635.000.
Andersen, Hans: *See—*
Strandberg, Hans G.; and Andersen, Hans, 4,535,776, Cl. 128-419.0PG.
Anderson, David M., to Phytogen. Plant vector. 4,536,475, Cl. 435-172.300.
Anderson, John. Three way valve. 4,535,821, Cl. 137-884.000.
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Hogg, Thomas M., 4,536,036, Cl. 299-43.000.
Andersson, Bo. Hydraulic valve means. 4,535,809, Cl. 137-596.140.
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Kijima, Takao; Maebayashi, Jiro; and Ando, Fumitaka, 4,536,007, Cl. 280-701.000.
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Takayama, Toshio; Ando, Hiromi; and Endou, Mitsuhiro, 4,535,680, Cl. 91-376.00R.
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Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takugi, 4,536,811, Cl. 360-96.600.
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Kaluzhsky, Nikolai A.; Badaliants, Khoren A.; Kostin, Ivan M.; Zatulovsky, Isaak A.; Korneev, Valentin I.; Andreev, Vladimir V.; Kuzmin, Boris A.; Sizyakov, Viktor M.; Shmorgunenko, Nikolai S.; Krochevsky, Vladislav A.; and Alexeev, Alexei I., 4,536,216, Cl. 106-38.300.
Andrews, Peter J., to Texas Instruments Incorporated. Direct A.C. to A.C. converter controlled by a data processor. 4,536,835, Cl. 363-163.000.
Angus Chemical Company: *See—*
Kayser, Robert B.; and Purcell, Robert F., 4,536,300, Cl. 252-8.55D.
Annen, Klaus: *See—*
Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, 4,536,401, Cl. 514-173.000.
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Alsenz, Richard H.; and Ansted, Roger C., 4,535,602, Cl. 62-175.000.
Anthony, Frank H. Refractory shelf for home hobbyist kiln and method of making kiln. 4,536,153, Cl. 432-258.000.
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Antpohler, Heinz-Josef. Device for the manufacture and processing of biscuit mixture shapes. 4,535,687, Cl. 99-334.000.
Aoai, Toshiaki: *See—*
Nagashima, Akira; Hasegawa, Akira; Aoai, Toshiaki; and Nagano, Teruo, 4,536,464, Cl. 430-192.000.
Aoki, Hidehiko: *See—*
Yoshida, Yoshihiro; and Aoki, Hidehiko, 4,536,716, Cl. 330-69.000.
Aoki, Takashi: *See—*
Nishikawa, Masao; and Aoki, Takashi, 4,535,652, Cl. 74-733.000.
Aono, Toshiaki: *See—*
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,536,466, Cl. 430-203.000.
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,536,467, Cl. 430-203.000.
Appel, Hans; and Heidenescher, Hermann, to Zundwarenfabrik Stracke GmbH & Co. Lateral-traction roller shade. 4,535,830, Cl. 160-299.000.
Ardit, Giuseppe: *See—*
Besson, Duilio; De Marco, Claudio; Peruzzo, Roberto; and Ardit, Giuseppe, 4,535,599, Cl. 62-154.000.
Arditty, Herve : *See—*
Graindorge, Philippe; and Arditty, Herve , 4,536,861, Cl. 367-149.000.
Arizona Chemical Company: *See—*
Davis, Curry B.; and Frade, Americo G. P., 4,536,332, Cl. 260-97.600.
Arnell Inc.: *See—*
Rabinowitz, Lewis, 4,535,761, Cl. 128-62.00A.
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Allen, Richard M.; Arnold, Jeffrey M.; Field, Joseph J.; and Spraker, Terry E., 4,536,770, Cl. 346-29.000.
Arnold, Lionel C., to Teepak, Inc. Method and apparatus for making improved end-closures for shirred tubular casings. 4,536,175, Cl. 493-308.000.
Artusi, Aldo, to Medipack AG. Container which is a form of packaging in particular for medicaments and the like and process for its manufacture. 4,535,890, Cl. 206-530.000.
Arvin Industries, Inc.: *See—*
Thayer, Timothy Z.; and Shaw, Frank W., 4,536,371, Cl. 422-171.000.
Asahara, Sunao: *See—*
Kozai, Yoshinori; Amemiya, Yoichi; and Asahara, Sunao, 4,536,649, Cl. 250-231.0SE.
Asahi Glass Company Ltd.: *See—*
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, 4,536,259, Cl. 204-35.100.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,536,352, Cl. 260-543.00F.
Moriguchi, Kisoo; and Ikegami, Tadashi, 4,536,550, Cl. 525-240.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Shono, Tetsuji, 4,536,070, Cl. 354-402.000.
ASARCO Incorporated: *See—*
Little, Victor, Jr.; and Thomas, Charles L., 4,536,152, Cl. 431-159.000.
Aschenbach, Louis F., to Eaton Corporation. Thermostat. 4,536,736, Cl. 337-317.000.
ASEA Aktiebolag: *See—*
Olsson, Ingemar, 4,535,949, Cl. 242-57.000.
Ashland Oil, Inc.: *See—*
Hettinger, William P., Jr.; and Lewis, James E., 4,536,281, Cl. 208-113.000.
Ashman, Arthur; and Bruins, Paul F., to Medical Biological Sciences, Inc. Polymeric acrylic prothesis. 4,535,485, Cl. 623-16.000.
Ashman, Arthur: *See—*
Bruins, Paul F.; and Ashman, Arthur, 4,536,158, Cl. 433-201.100.
Ashworth, Denis H., to Simon Engineering Dudley Limited. Vehicle stabilizing system. 4,536,009, Cl. 280-755.000.
Astra Lakemedel Aktiebolag: *See—*
Helgstrand, Åke J. E.; Johansson, Karl N. G.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran B., 4,536,400, Cl. 514-120.000.
AT&T Bell Laboratories: *See—*
Ahiskali, Serhat M., 4,536,826, Cl. 361-407.000.
Basarath, Brian A.; and Kakalec, Robert J., 4,536,715, Cl. 330-2.000.
Farah, Robert L., 4,536,741, Cl. 340-347.0DD.
Jin, Sungho; and Tiefel, Thomas H., 4,536,229, Cl. 148-31.550.
Kemper, Kyran B., 4,536,706, Cl. 324-117.00R.
Lancaster, Loren T., 4,535,532, Cl. 29-576.00B.
Ray, Richard C., 4,536,696, Cl. 320-21.000.
AT&T Information Systems: *See—*
Baker, Donn; Clarke, John E.; and Johnson, Chris G., 4,536,052, Cl. 339-126.00R.

AT&T Technologies, Inc.: *See*—
Dines, David R.; Svoboda, George; and Workman, Robert G., 4,535,535, Cl. 29-845.000.
Jablway, Ali N.; and Mitchell, Alexander M., 4,536,703, Cl. 324-52.000.
Rieman, Richard F., 4,536,622, Cl. 179-103.000.

Atalla Corporation: *See*—
Atalla, Martin M.; and Bestock, Ralph R., 4,536,647, Cl. 235-379.000.

Atalla, Martin M.; and Bestock, Ralph R., to Atalla Corporation. Pocket banking terminal, method and system. 4,536,647, Cl. 235-379.000.

Ateliers de Constructions Mecaniques de Vevey S.A.: *See*—
Hess, Fritz; and Dalliard, Fernand, 4,535,702, Cl. 105-4.00R.

Atkinson, Gordon E.; and Kubina, Stephen J., to Vernay Laboratories, Inc. Valve assembly. 4,535,819, Cl. 137-846.000.

Atlantic Richfield Company: *See*—
Erickson, Mark R.; and Kaehler, James A., 4,536,847, Cl. 364-516.000.

Atochem: *See*—
Lacombe, Jean-Loup; and Brun, Claude, 4,536,484, Cl. 502-62.000.
Tatin, Gerard, 4,536,182, Cl. 8-107.000.

Atomic Energy of Canada Limited: *See*—
Wanke, Sieghard E.; Rangwala, Huseni A.; Otto, Fred D.; Dalla Lana, Ivo G.; Paterson, Linda M.; and Rolston, John H., 4,536,488, Cl. 502-159.000.

Atwell, George. Desalination system. 4,536,257, Cl. 202-177.000.

Audeh, Costandi A., to Mobil Oil Corporation. Enhanced recovery of hydrocarbonaceous fluids from oil shale. 4,536,279, Cl. 208-11.00R.

Augat Inc.: *See*—
Wyss, Robert P., 4,535,536, Cl. 29-845.000.

Augsburger, John J.; and Darlington, R. Keith. Corrosion inhibition of aqueous brines. 4,536,302, Cl. 252-8.55R.

Autoflow Engineering Limited: *See*—
Soper, Peter H. H.; and Cammack, Andrew S., 4,535,566, Cl. 51-124.00L.

Automated Container Corporation: *See*—
Zysset, Edgar H., 4,535,909, Cl. 220-273.000.

Averill, John A., to Allied Corporation. Analyzer maintenance. 4,535,522, Cl. 29-280.000.

Avery, Robert C. Engine turning tool bracket. 4,535,655, Cl. 81-484.000.

Awaji Sangyo Kabushiki Kaisha: *See*—
Mio, Mitsushi; and Negita, Hisao, 4,536,645, Cl. 219-543.000.

Axonics, Inc.: *See*—
Barnes, Clarence W., 4,536,655, Cl. 250-461.100.

B.A.T. Cigaretten-Fabriken GmbH: *See*—
Grell, Karl-Heinz; and Krappitz, Heinz, 4,535,885, Cl. 198-695.000.

B. F. Goodrich Company, The: *See*—
George, Thomas R., Jr.; and Lochhead, Robert Y., Jr., 4,536,528, Cl. 524-313.000.
Rahrig, Douglas B., 4,536,360, Cl. 264-142.000.
Wright, Robert B., 4,535,490, Cl. 4-585.000.

B.W.B. Controls, Inc. (Louisiana): *See*—
Bergeron, Ned A., 4,535,899, Cl. 212-153.000.

Baba, Kiyokazu, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for palletizing pressings. 4,536,118, Cl. 414-43.000.

Babbitt, Brett A.; Le, Tri C.; and Noble, Bruce P., to Joy Manufacturing Company. Expanding gate valve with fluid-powered actuator. 4,535,967, Cl. 251-54.000.

Babcock & Wilcox Company, The: *See*—
Berthold, John W., III; and Fitzgerald, Charles S., 4,536,827, Cl. 362-32.000.

Babcock, William E., to RCA Corporation. Multiple scan rate deflection circuit incorporating scan compensation. 4,536,684, Cl. 315-411.000.

Babineaux, David, III. Method of treating waste water. 4,536,293, Cl. 210-717.000.

Baboulet, Jean-Pierre C.: *See*—
Ramisse, Yves D.; Baboulet, Jean-Pierre C.; Vie, Michel P.; and Malaval, Paul C., 4,536,327, Cl. 252-511.000.

Backus, Alan L.: *See*—
Bartok, Stephen; Stansbury, Benjamin H., Jr.; and Backus, Alan L., 4,535,931, Cl. 236-20.00R.

Badaliants, Khoren A.: *See*—
Kaluzhsky, Nikolai A.; Badaliants, Khoren A.; Kostin, Ivan M.; Zatulovsky, Isaak A.; Korneev, Valentin I.; Andreev, Vladimir V.; Kuzmin, Boris A.; Sizyakov, Viktor M.; Shmorgunenko, Nikolai S.; Krochevsky, Vladislav A.; and Alexeev, Alexei I., 4,536,216, Cl. 106-38.300.

Baertschi, Peter; Wetter, Kurt; and Graf, Felix, to Rieter Machine Works, Ltd. Draw-roll assembly. 4,535,515, Cl. 28-245.000.

Bahr, Dietrich J.; Burckardt, Karl-Heinz; Goldrian, Gottfried; Rudolph, Volker; and Spruth, Wilhelm G., to International Business Machines Corporation. Method of recording information on an electrosensitive record carrier. 4,536,769, Cl. 346-1.100.

Bahr, Richard G.; and Hogan, Thomas C., to Prime Computer, Inc. Self initializing phase locked loop ring communications system. 4,536,876, Cl. 370-86.000.

Bains, Paul C. Apparatus for observation in a high velocity liquid stream. 4,536,789, Cl. 358-99.000.

Baker Aktiengesellschaft: *See*—
Junge, Bodo; and Muller, Lutz, 4,536,493, Cl. 514-25.000.

Baker, Donn; Clarke, John E.; and Johnson, Chris G., to AT&T Information Systems. Modular cross-connect panel. 4,536,052, Cl. 339-126.00R.

Baker Oil Tools, Inc.: *See*—
Ross, Richard J., 4,535,842, Cl. 166-63.000.

Baker, Richard H., to Gould, Inc. Field effect regulator with stable feedback loop. 4,536,699, Cl. 323-276.000.

Ballard, Denis G. H.; Courtis, Andrew; and Shirley, Ian M., to Imperial Chemical Industries Limited. Preparation of aromatic polymers from cyclohexa-3,5-diene polymers. 4,536,555, Cl. 526-295.000.

Baltek Corp.: *See*—
Kohn, Henri-Armand, 4,536,427, Cl. 428-44.000.

BancTec, Inc.: *See*—
Torkelson, John; and Sanders, Weldon A., Jr., 4,536,801, Cl. 358-280.000.

Banfi, Ambrogio, to Alfa Romeo Auto S.p.A. Device for automatically varying the timing of a camshaft. 4,535,731, Cl. 123-90.150.

Barberis, Dario, to WABCO Westinghouse Compagnia Freni S.p.A. Vehicle braking apparatus and method. 4,536,039, Cl. 303-16.000.

Barillo, Joseph: *See*—
Urban, Warren J.; Barillo, Joseph; and Krupa, Jerry J., 4,536,338, Cl. 260-400.000.

Barker, Peter L.: *See*—
Biftu, Tesfaye; Witzel, Bruce E.; and Barker, Peter L., 4,536,512, Cl. 514-413.000.

Barlow, Anthony; and Maringer, Melvin F., to National Distillers and Chemical Corporation. Water tree resistant compounds and polymer compositions containing the same. 4,536,530, Cl. 524-109.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Post, Karl-Heinz; and Eich, Otwin, 4,535,966, Cl. 251-31.000.

Barnes, Clarence W., to Axonics, Inc. Fluorometer having an improved optical system. 4,536,655, Cl. 250-461.100.

Barnes-Hind, Inc.: *See*—
Lim, Drahoslav; Kulkarni, Chidambar L.; and Repella, Dennis A., 4,536,554, Cl. 526-264.000.

Barnes, Ronald L.: *See*—
Kruse, Richard M.; Moffett, David J.; Patel, Madhu C.; and Barnes, Ronald L., 4,536,648, Cl. 235-454.000.

Barrett, Howard W.; and Fledderjohann, Paul F., to Goodyear Aerospace Corporation. Indirect cooling of electronic circuits. 4,536,824, Cl. 361-384.000.

Barth, Wayne E., to Pfizer Inc. 6-(Aminomethyl)penicillanic acid 1,1-dioxide esters and intermediates therefor. 4,536,393, Cl. 424-114.000.

Bartok, Stephen; Stansbury, Benjamin H., Jr.; and Backus, Alan L., to Scott, Kenneth W. Energy conserving water heater control system. 4,535,931, Cl. 236-20.00R.

Bartsch, Kenneth E.: *See*—
Gard, Eric A.; Kautter, William J., Jr.; and Bartsch, Kenneth E., 4,535,854, Cl. 177-1.000.

Baryshnikov, Anatoly I.: *See*—
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.

Basarath, Brian A.; and Kakalec, Robert J., to AT&T Bell Laboratories. Linear dual detector opto-isolator circuit. 4,536,715, Cl. 330-2.000.

BASF Aktiengesellschaft: *See*—
Hambrecht, Juergen; Reffert, Rudi W.; Minges, Peter; and Swoboda, Johann, 4,536,567, Cl. 528-486.000.
Horner, Michael; and Irgang, Matthias, 4,536,347, Cl. 260-465.00F.
Wegner, Gerhard; and Wernet, Wolfgang, 4,536,262, Cl. 204-56.00R.

BASF Wyandotte Corporation: *See*—
Heyman, Duane A., 4,536,557, Cl. 528-52.000.

Batchelor, William H., to Propane Carburetion Systems, Inc. Fuel feed control system and control valve for dual fuel operation of an internal combustion engine. 4,535,728, Cl. 123-27.0GE.

Bateman, Wayne: *See*—
Kruger, Robert A.; and Bateman, Wayne, 4,536,790, Cl. 358-111.000.

Battelle Memorial Institute: *See*—
Prost, Jean-Louis; and Gross, Daniel, 4,535,627, Cl. 73-290.00B.

Baudis, Ulrich: *See*—
Beyer, Hans-Hermann; Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, 4,536,224, Cl. 148-6.110.

Bauer, Eckhart: *See*—
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Bauer, Fritz. Adjustable mountings for a movie camera. 4,536,066, Cl. 352-35.000.

Baum, Helmut; Pfizenmaier, Heinz; Schmidt, Ewald; and Strauss, Franz, to Robert Bosch GmbH. Inductive pressure sensor using two oscillators. 4,536,719, Cl. 331-37.000.

Baum, Marcel, to Dragerwerk Aktiengesellschaft. Method and apparatus for monitoring a respirator usable with an endotracheal tube. 4,535,766, Cl. 128-204.230.

Bauscher, Billy J.: *See*—
Sandy, Julius W.; Riebock, William D.; and Bauscher, Billy J., 4,536,107, Cl. 408-214.000.

Bayer Aktiengesellschaft: *See*—
Fiedler, Paul; and Braden, Rudolf, 4,536,344, Cl. 260-465.00R.
Fischer, Wolfgang; and Leiblein, Felix, 4,536,511, Cl. 514-404.000.
Kranz, Eckart; and Findeisen, Kurt, 4,536,353, Cl. 260-545.00R.
Maurer, Fritz, 4,536,574, Cl. 544-253.000.
Schmidt, Manfred; and Dicke, Hans-Rudolf, 4,536,561, Cl. 528-191.000.

Sirrenberg, Wilhelm; Marhold, Albrecht; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, 4,536,587, Cl. 549-366.000.

Bebie, Alain M. Keyboard design. 4,536,625, Cl. 200-5.00A.

Becker, John R. Battery security and hold-down device. 4,535,863, Cl. 180-68.500.

Becker, Wilfried: *See*—
Panhke, Klaus-Dieter; and Becker, Wilfried, 4,535,677, Cl. 89-46.000.

Becnel, Larry H., to General Dynamics, Pomona Division. Inspection device and method for cylindrical work pieces. 4,535,545, Cl. 33-550.000.

Becton, Dickinson and Company: *See*—
Burns, James A., 4,535,769, Cl. 128-314.000.

Bedard, Jean T.: *See*—
Provost, Pierre; and Bedard, Jean T., 4,535,858, Cl. 177-134.000.

Behrens, Henry: *See*—
Kiricoples, Charles P.; Behrens, Henry; and Brown, Robert L., 4,536,099, Cl. 401-209.000.

Beier, Sybille: *See*—
Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, 4,536,401, Cl. 514-173.000.

Beiersdorf Aktiengesellschaft: *See*—
Schmeer, Gert; Engelmann, Eberhard; and Schafer, Karl, 4,536,441, Cl. 428-317.300.

Beijen, James H.: *See*—
Ramey, Carl; Hill, Royce W.; and Beijen, James H., 4,535,925, Cl. 227-55.000.

Belanger, Patrice C.; and Gillard, John W., to Merck Frosst Canada, Inc. Substituted phenylalkenoic acids and esters. 4,536,515, Cl. 514-532.000.

Belbel, Elie; Blanchard, Christian; Fechant, Louis; Haury, Andre ; and Lauraire, Michel, to La Telemecanique Electrique. Limiting switch. 4,536,630, Cl. 200-151.000.

Belew, Robert R., to United States of America, National Aeronautics and Space Administration. Variable length strut with longitudinal compliance and locking capability. 4,536,114, Cl. 410-156.000.

Bell, David J.: *See*—
Jones, Harold; and Bell, David J., 4,535,898, Cl. 211-153.000.

Bell, Edward D. Apparatus for rapid refueling of armored fighting vehicles. 4,535,826, Cl. 141-231.000.

Bellis, Robert D.; Tod, Timothy W.; and Tod, Roger J., to Coin Controls Limited. Machine having a coin or token payout mechanism. 4,535,794, Cl. 133-8.00E.

Bello, Vincent G.; and Sweeting, Charles W., to United Technologies Corporation. Boost feedforward pulse width modulation regulator. 4,536,700, Cl. 323-285.000.

Beloit Corporation: *See*—
Justus, Edgar J., 4,536,255, Cl. 162-358.000.

Belsterling, Charles A.; and Soberman, Robert K., to Calspan Corporation. Tool-supporting self-propelled robot platform. 4,536,690, Cl. 318-687.000.

Belvederi, Bruno, to G.D. Societa per Azioni. Device for dispensing viscous materials. 4,535,693, Cl. 101-366.000.

Ben Clements & Sons, Inc.: *See*—
Furutsu, Akira, 4,535,926, Cl. 227-67.000.

Bendix Corporation, The: *See*—
Kytta, Oswald O., 4,535,679, Cl. 91-376.00R.

Benesh, Vladimir. Cartridge holder. 4,535,558, Cl. 42-89.000.

Bennett, John A.: *See*—
Himsley, Alexander; and Bennett, John A., 4,536,287, Cl. 210-293.000.

Benson, Robert F., to Nicolet Instrument Corporation. Multi-layer circuit board inspection system. 4,536,239, Cl. 156-64.000.

Bentson, Wade A., to Amco Corporation. Tortilla basket fryer. 4,535,688, Cl. 99-353.000.

Berbalk, Hermann, to Oerlikon-Boehringer GmbH. Power-driven steady rest for lathes. 4,535,661, Cl. 82-40.00R.

Berg, Harvey J., to Minnesota Mining and Manufacturing Company. Molded fibrous filtration products. 4,536,440, Cl. 428-284.000.

Bergen, Henry M.; Zaimi, Sedat; Castellano, Vincenzo; and Schildkraut, Irwin, to IPC Communications, Ltd. Dual talk path key telephone. 4,536,621, Cl. 179-99.00R.

Bergeron, Ned A., to B.W.B. Controls, Inc. (Louisiana). Boom warning actuator. 4,535,899, Cl. 212-153.000.

Berggren, Benny: *See*—
Gripenholt, Ninneh; Berggren, Benny; and Boling, Goran, 4,536,242, Cl. 156-96.000.

Bergh, Ralph A.: *See*—
Shaw, Herbert J.; and Bergh, Ralph A., 4,536,058, Cl. 350-320.000.

Berglund, Lars G.; Bjorklund, Sven-Erik B.; and Linde, Lars H., to Aktiebolaget Electrolux. Operating device in a dish-washing machine. 4,536,043, Cl. 312-222.000.

Bergwitz-Larsen, Carl-Aage; and Osterlund, Rolf G. L., to KabiVitrum AB. Novel pharmaceutical composition. 4,536,495, Cl. 514-54.000.

Bernat, Fred B., to San-Mar Laboratories, Inc. Activated silicon-containing aluminum complex and process of preparation and use. 4,536,394, Cl. 424-154.000.

Bernstein, Joel E., to Dermatological Enterprises, Ltd. Method and composition for treating post-herpetic neuralgia. 4,536,404, Cl. 424-324.000.

Bertelsen, Per M., to Kemotron A/S. Process for controlling the properties of white liquor. 4,536,253, Cl. 162-30.110.

Berthold, John W., III; and Fitzgerald, Charles S., to Babcock & Wilcox Company, The. Image collection and object illumination. 4,536,827, Cl. 362-32.000.

Bertiller, Roland: *See*—
Politzer, Anton; and Bertiller, Roland, 4,535,676, Cl. 89-14.100.

Bertram, Dieter: *See*—
Loth, Fritz; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,536,217, Cl. 106-122.000.

Besson, Duilio; De Marco, Claudio; Peruzzo, Roberto; and Ardit, Giuseppe, to Industrie Zanussi S.p.A. Control device for refrigerating equipment. 4,535,599, Cl. 62-154.000.

Bestock, Ralph R.: *See*—
Atalla, Martin M.; and Bestock, Ralph R., 4,536,647, Cl. 235-379.000.

Beyer, Hans-Hermann; Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, to Degussa Aktiengesellschaft. Salt bath for the currentless production of wear resistant boride layers. 4,536,224, Cl. 148-6.110.

Bhatia, Harsaran S.; Dorler, Jack A.; Gaur, Santosh P.; Lechaton, John S.; Mosley, Joseph M.; and Srinivasan, Gurumakonda R., to International Business Machines Corporation. Method and resulting structure for selective multiple base width transistor structures. 4,535,531, Cl. 29-577.00C.

Bianchini, Gregory M.; and McRae, Thomas G., to United States of America, Energy. Vapor spill monitoring method. 4,535,639, Cl. 73-863.110.

Biberbach, Peter: *See*—
Beyer, Hans-Hermann; Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, 4,536,224, Cl. 148-6.110.

Bick, David E.; Flippance, Christopher F.; and Parry, Ian C., to Dowty Hydraulic Units Limited. Retarders suitable for wagon speed control and having means for holding them in their operative condition. 4,535,872, Cl. 188-62.000.

Bickerstaff, Alan E.; Cotton, Austin H.; Ladell, Michael G.; and Neale, David M., to Xerox Corporation. Apparatus for supplying a liquid to a heated surface. 4,536,076, Cl. 355-3.0FU.

Biftu, Tesfaye; Witzel, Bruce E.; and Barker, Peter L., to Merck & Co., Inc. 5-(2,3-Dihydro-1H-pyrrolizin-5-oyl)-2,3-dihydro-1H-pyrrolizine-1-alkanoic or carboxylic acids and use thereof as anti-inflammatory and analgesic agents. 4,536,512, Cl. 514-413.000.

Binder, Paul B.; and Kroninger, Paul M., Jr., to General Signal Corporation. Electrical feedthrough means for pressure transducer. 4,536,820, Cl. 361-283.000.

Biolectron, Inc.: *See*—
Brighton, Carl T.; and Pollack, Solomon R., 4,535,775, Cl. 128-419.00F.

Biomatics Inc.: *See*—
Gardos, Ivan, 4,535,585, Cl. 53-247.000.

Bischoff, Andrea L.; and Chin, Robert W., to Goodyear Aerospace Corporation. Safety device for venting aircraft tires. 4,535,957, Cl. 244-103.00R.

Bishop, Sarah M.; and Curtis, Paul T., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Brittanic Majesty's Government of the. Fibre reinforced composites. 4,536,438, Cl. 428-246.000.

Bjorklund, Sven-Erik B.: *See*—
Berglund, Lars G.; Bjorklund, Sven-Erik B.; and Linde, Lars H., 4,536,043, Cl. 312-222.000.

Black Clawson Company, The: *See*—
Couture, Joseph W., 4,535,943, Cl. 241-46.020.

Black & Decker, Inc.: *See*—
Chan, Ven L., 4,536,641, Cl. 219-253.000.

Blackburn, Linda B.; and Ellingsworth, John R., to United States of America, National Aeronautics and Space Administration. Tensile testing apparatus. 4,535,636, Cl. 73-831.000.

Blackburn, Tom L., to GTE Communications Products Corporation. Signal detector apparatus. 4,536,871, Cl. 370-74.000.

Blair, Bruce W.: *See*—
Navarro, Luis J.; Peter, Joseph R.; and Blair, Bruce W., 4,536,760, Cl. 340-722.000.

Blanc, Guy-Francois; and Loehrer, Fritz, to Maag Gear-Wheel and Machine Company. Arrangement for starting-up a position regulator of a grinding wheel support. 4,535,569, Cl. 51-165.900.

Blanchard, Christian: *See*—
Belbel, Elie; Blanchard, Christian; Fechant, Louis; Haury, Andre ; and Lauraire, Michel, 4,536,630, Cl. 200-151.000.

Blanchart, Alain P. O.; and Adriaensen, Ludovicus C. M., to Electrochemische Energieconversie N.V. Porous electrode. 4,536,272, Cl. 204-294.000.

Blanchette, Leon G.: *See*—
Hebert, Philip J.; and Blanchette, Leon G., 4,535,750, Cl. 126-41.00B.

Blandino, Silvano: *See*—
Greco, Claudio; and Blandino, Silvano, 4,536,139, Cl. 417-471.000.

Blazek, Zdenek: *See*—
Landa, Vaclav; and Blazek, Zdenek, 4,536,230, Cl. 148-31.570.

Blickenstaff, Ronald L.: *See*—
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,536,836, Cl. 364-200.000.

Bliefert, Claus; Boldhaus, Hans-Michael; and Hoffmann, Manfred, to Hewing GmbH & Co. Process for the fluorination of a surface layer of formed bodies made of plastics. 4,536,266, Cl. 204-159.180.

Bloch, Aaron N.: *See*—
Sheng, Ping; and Bloch, Aaron N., 4,536,608, Cl. 136-259.000.

Bloom, Daniel M.: *See*—
Sands, Robert W.; and Bloom, Daniel M., 4,536,834, Cl. 362-303.000.

Blum, Helmut, to Henkel Kommanditgesellschaft auf Aktien. Dihydroxyalkane diphosphonic acids. 4,536,348, Cl. 260-502.40P.

Blytas, George C., to Shell Oil Company. Process for the removal of H_2S and adjustment of the H_2/CO ratio in gaseous streams containing hydrogen sulfide, carbon monoxide, and hydrogen. 4,536,381, Cl. 423-437.000.

Blytas, George C., to Shell Oil Company. Process for the conversion of H_2S and adjustment of the H_2/CO ratio in gaseous streams containing hydrogen sulfide, hydrogen, and carbon monoxide. 4,536,382, Cl. 423-437.000.

Boatright, Donald E., to Green, Robert G. Separator. 4,536,177, Cl. 494-44.000.

Boatright, Edward. Isometric golf trainer device and method. 4,535,991, Cl. 273-193.00A.

BOC Group, Inc., The: *See*—
Miller, Elwood O., 4,535,812, Cl. 137-624.110.

Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. 1-Hydroxymethyl-2-acyl cyclopropane derivatives and esters and cyclic condensation products thereof, organoleptic uses of same and processes for preparing same. 4,536,330, Cl. 252-522.00R.

Boeing Company, The: *See*—
Bryan, Darold R.; and Porter, George Z., 4,535,717, Cl. 114-230.000.
Lambregts, Antonius A., 4,536,843, Cl. 364-434.000.
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,536,559, Cl. 528-170.000.

Boeve, Gerard J.: *See*—
De Schamphelaere, Lucien A.; De Cock, Etienne M.; De Bondt, Werner E.; Librecht, Freddy M.; Boeve, Gerard J.; and Van Peteghem, Willy F., 4,536,778, Cl. 346-160.000.

Boggs, William E.; and Keener, Everett L., to United States Steel Corporation. System for controlling the composition of a fuel gas produced by a jet compressor system. 4,536,194, Cl. 48-180.100.

Boldhaus, Hans-Michael: *See*—
Bliefert, Claus; Boldhaus, Hans-Michael; and Hoffmann, Manfred, 4,536,266, Cl. 204-159.180.

Boley, Robert E. Automatic liquid shut-off valve. 4,535,799, Cl. 137-174.000.

Boliden Aktiebolag: *See*—
Lindahl, Gertrud M., 4,536,384, Cl. 423-556.000.

Boling, Goran: *See*—
Gripenholt, Ninneh; Berggren, Benny; and Boling, Goran, 4,536,242, Cl. 156-96.000.

Boltrek, Henry, to Westinghouse Electric Corp. Escalator. 4,535,880, Cl. 198-330.000.

Boltswitch, Inc.: *See*—
Erickson, John W., 4,536,046, Cl. 339-31.00M.

Bonazzo, Robert. Water filtration device. 4,536,290, Cl. 210-419.000.

Bonk, Joseph P., to Colgate-Palmolive Company. Pre-moistened towelette dispenser. 4,535,912, Cl. 221-46.000.

Bonney, Robert D.: *See*—
Price, Michael G.; Zehl, Otis G.; and Bonney, Robert D., 4,536,062, Cl. 350-358.000.

Bookout, Russell J.; Pearson, Bernard A.; and Jacobs, John W., to TRW Inc. Submergible pumping apparatus. 4,536,137, Cl. 417-390.000.

Borchardt, John K., to Halliburton Company. Methods of minimizing fines migration in subterranean formations. 4,536,303, Cl. 252-8.55R.

Borchardt, John K., to Halliburton Company. Methods of minimizing fines migration in subterranean formations. 4,536,304, Cl. 252-8.55R.

Borchardt, John K.; and Young, Bill M., to Halliburton Company. Methods for stabilizing swelling clays or migrating fines in subterranean formations. 4,536,305, Cl. 252-8.55R.

Borden, Inc.: *See*—
Shiau, David W.; and Smith, Eric, 4,536,245, Cl. 156-307.300.

Borg-Warner Corporation: *See*—
Sturges, Fred D., 4,535,879, Cl. 192-52.000.

Borggrefe, Gerhard; and Hase, Christian, to Henkel Kommanditgesellschaft auf Aktien. Preparation of stable oil-in-water emulsions of high oil content. 4,536,325, Cl. 252-314.000.

Borisch, Donald J.; Hanrahan, Gary V.; and Merritt, Herbert E., to Cincinnati Milacron Inc. Machine operation monitor. 4,536,849, Cl. 364-550.000.

Borisoff, David J. String bender attachment construction. 4,535,670, Cl. 84-312.00R.

Borsodi, Istvan: *See*—
Falk, Robert A.; and Borsodi, Istvan, 4,536,254, Cl. 162-135.000.

Borta, Ronald. Autogrammer. 4,536,840, Cl. 364-300.000.

Bossart, Erwin: *See*—
Wildi, Edwin; Bossart, Erwin; and Hasler, Hans, 4,535,956, Cl. 242-151.000.

Bosse, Thomas W., to Pitney Bowes Inc. Optical weighing scale utilizing a prism. 4,536,651, Cl. 250-231.00R.

Botar, Bela. Vertically inclined engine low floor bus. 4,535,867, Cl. 180-294.000.

Bouchard, Andre C.; Maya, Jakob; and Sentementes, Thomas, to GTE Products Corporation. Glass coated metal arc director for compact fluorescent lamp. 4,536,678, Cl. 313-493.000.

Bourgeois, Jean-Louis, to Foyer d'Aciernergie Inc. Heat recuperator for fireplace. 4,535,751, Cl. 126-121.000.

Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Santamaria, Raphael, to Delalande S.A. Aromatic derivatives comprising an aminoalkoxy chain and pharmaceutical compositions thereof. 4,536,500, Cl. 514-212.000.

Bourn, Hugh E.: *See*—
Musto, Franklyn K.; Bourn, Hugh E.; Buchanan, John; and Kay, Duncan A., 4,535,477, Cl. 2-2.10R.

Boutaleb, Aboubekr: *See*—
Boutaleb, Lucy A.; Boutaleb, Aboubekr; and Kerekess, Tibor T., 4,536,014, Cl. 283-83.000.

Boutaleb, Lucy A.; Boutaleb, Aboubekr; and Kerekess, Tibor T., to Securicard Systems Limited. Indentification of articles using liquid crystal identity cards. 4,536,014, Cl. 283-83.000.

Bovenkerk, Harold P.; Gigl, Paul D.; and Corrigan, Francis R., to General Electric Company. Process for making diamond and cubic boron nitride compacts. 4,536,442, Cl. 428-323.000.

Bovo, Amilcare; and Canato, Luigi, to Italtel Societa Italiana Telecomunicazioni. PCM Switching network with surplus capacity. 4,536,870, Cl. 370-16.000.

Bowen, David R.: *See*—
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,536,299, Cl. 252-8.600.

Boyadjieff, George I.; and Krasnov, Igor, to Varco International, Inc. Drill string valve actuator. 4,535,852, Cl. 175-170.000.

Boyer, Robert E. Vehicle mountable electrical generating system. 4,536,668, Cl. 310-75.00R.

Boyle, Frederick P.: *See*—
Brubaker, Ronald L.; Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; Boyle, Frederick P.; Parkinson, Truman D.; and Rine, James C., 4,535,941, Cl. 241-21.000.

Braden, Rudolf: *See*—
Fiedler, Paul; and Braden, Rudolf, 4,536,344, Cl. 260-465.00R.

Bradshaw, John: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; Mackinnon, John W. M.; Judd, Duncan B.; and Hayes, Roger, 4,536,508, Cl. 514-383.000.

Brady, William C.: *See*—
Perkins, Richard A.; Brady, William C.; and Turner, Paul W., 4,536,202, Cl. 65-1.000.

Braid, Milton; and Landis, Phillip S., to Mobil Oil Corporation. Additives for improving the research octane number of liquid hydrocarbon fuels. 4,536,192, Cl. 44-68.000.

Brand, Leonard J.; and Nadelson, Jeffrey, to Sandoz, Inc. Isoxazolyl indolamines having anti-diabetic activity. 4,536,499, Cl. 514-212.000.

Brander, Rita W.; Hammond, John E.; and Pasch, John H., to General Foods Corporation. Red colored meat analog. 4,536,406, Cl. 426-104.000.

Branson, Terry L. Print head carriage mechanism including a drive belt. 4,536,096, Cl. 400-120.000.

Bray, John E.: *See*—
Calnek, Trevor A.; and Bray, John E., 4,536,775, Cl. 346-76.0PH.

Brennan, Edward J., to PTC Aerospace Inc. Convertible seating unit. 4,536,027, Cl. 297-124.000.

Brennan, Michael E.: *See*—
Grigsby, Robert A., Jr.; Speranza, George P.; Brennan, Michael E.; and Yeakey, Ernest L., 4,536,522, Cl. 521-172.000.

Brett, Robert A.: *See*—
Solomon, David H.; Ross, John B.; Girolamo, Mario; and Brett, Robert A., 4,536,016, Cl. 283-111.000.

Brice, John C.; Page, John L.; and Whiffin, Peter A. C., to U.S. Philips Corporation. Liquid phase epitaxy apparatus. 4,535,720, Cl. 118-415.000.

Brice, John C.; and Brough, Colin R., to U.S. Philips Corporation. Method of and apparatus for producing a controlled unsaturated vapor pressure of a volatile liquid in a heat treatment chamber. 4,536,227, Cl. 148-13.100.

Bridgestone Tire Co., Ltd.: *See*—
Dan, Takuya; and Fujita, Akio, 4,535,976, Cl. 267-8.00R.

Bridon, Jean-Noel: *See*—
Marcoux, Bernard; and Bridon, Jean-Noel, 4,536,506, Cl. 514-342.000.

Briggs, Paul C., to Illinois Tool Works Inc. (Meth)acrylate-based compositions. 4,536,546, Cl. 525-83.000.

Bright, John H.: *See*—
Savides, Christos; and Bright, John H., 4,536,596, Cl. 562-443.000.

Brighton, Carl T.; and Pollack, Solomon R., to Biolectron, Inc. Method for treatment of non-union bone fractures by non-invasive electrical stimulation. 4,535,775, Cl. 128-419.00F.

Bristol-Myers Company: *See*—
Kim, Choung U.; and Micso, Peter F., Jr., 4,536,335, Cl. 260-245.20T.

British Petroleum Company p.l.c., The: *See*—
Cayless, Richard A.; and Thukral, Prem S., 4,536,225, Cl. 148-6.15R.

Brockhaus, Peter B. Window insulator. 4,535,828, Cl. 160-84.00R.

Brodrene Gram A/S: *See*—
Gram, Klaus, 4,535,605, Cl. 62-345.000.

Bronfenbrenner, James C.; Skinner, Ronald W.; and Znaimer, Samuel, to International Coal Refining Company. Integrated two-stage coal liquefaction process. 4,536,275, Cl. 208-10.000.

Brorsson, Fritz L.; Dahlberg, Bengt A. G.; and Holmberg, Bengt M., to Gambro Lundia AB. System for venting gases in fluids passing through a conduit. 4,536,201, Cl. 55-189.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Sakakibara, Kenji, 4,536,691, Cl. 318-696.000.

Brough, Colin R.: *See*—
Brice, John C.; and Brough, Colin R., 4,536,227, Cl. 148-13.100.

Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, to Texaco Inc. Method for producing viscous hydrocarbons from discrete segments of a subterranean layer. 4,535,845, Cl. 166-272.000.

Brown, Dale M., to General Electric Company. Field effect semiconductor devices and method of making same. 4,536,782, Cl. 357-23.100.

Brown, Edgar D., Jr., to General Electric Company. Phenyl-containing organopolysiloxanes. 4,536,590, Cl. 556-453.000.

Brown, Milton F., Jr. Vehicle safety restraint device. 4,536,008, Cl. 280-730.000.

Brown, Neil L., to Neil Brown Instrument Systems, Inc. Analog to digital converter for precision measurements of A.C. signals. 4,536,744, Cl. 340-347.0AD.

Brown, Robert L.: *See*—
Kiricopies, Charles P.; Behrens, Henry; and Brown, Robert L., 4,536,099, Cl. 401-209.000.

Brown & Williamson Tobacco Corporation: *See*—
Luke, John A., 4,535,793, Cl. 131-336.000.
Naslund, Erik I.; and Reed, Steven P., 4,536,149, Cl. 425-394.000.

Browne, Leslie J., to Ciba-Geigy Corporation. Certain N-(pyridyl) indoles. 4,536,505, Cl. 514-339.000.

Brubaker, Ronald L.; Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; Boyle, Frederick P.; Parkinson, Truman D.; and Rine, James C., to Goodyear Tire & Rubber Company, The. Method of comminuting elastomeric pellets. 4,535,941, Cl. 241-21.000.

Bruel, Michel, to Commissariat a l'Energie Atomique. Process and apparatus for obtaining beams of particles with a spatially modulated density. 4,536,657, Cl. 250-492.200.

Bruins, Paul F.; and Ashman, Arthur, to Medical Biological Sciences, Inc. Oral prosthesis and method for producing same. 4,536,158, Cl. 433-201.100.

Bruins, Paul F.: *See*—
Ashman, Arthur; and Bruins, Paul F., 4,535,485, Cl. 623-16.000.

Bruker Analytische MeBtechnik GmbH: *See*—
Keller, Tony W.; and Muller, Wolfgang, 4,535,595, Cl. 62-3.000.

Brun, Claude: *See*—
Lacombe, Jean-Loup; and Brun, Claude, 4,536,484, Cl. 502-62.000.

Brunswick Corporation: *See*—
Hlava, Lorens G., 4,535,561, Cl. 43-22.000.

Brust, John E. Sealing system. 4,535,997, Cl. 277-102.000.

Bryan, Darold R.; and Porter, George Z., to Boeing Company, The. Marine surface debris deflector. 4,535,717, Cl. 114-230.000.

Brynielsson, Thore; Tomasson, Tom; Ahlberg, Leif; and Johansson, Magnus, to Ab Thoreb. Movable foot-step for a vehicle. 4,536,004, Cl. 280-166.000.

Buat, Mario: *See*—
Knirsch, Franco; Gianolini, Giovanni; Dagna, Gian D.; and Buat, Mario, 4,536,776, Cl. 346-140.00R.

Buchanan, John: *See*—
Musto, Franklyn K.; Bourn, Hugh E.; Buchanan, John; and Kay, Duncan A., 4,535,477, Cl. 2-2.10R.

Bucher, Bernard P.: *See*—
Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., 4,536,580, Cl. 546-124.000.

Buchholz, Rainer; Tomashauser, Josef; Zodrow, Rudolf; and Mohn, Hans-Werner, to Jagenberg AG. Method and apparatus for foil-capping bottles. 4,536,247, Cl. 156-477.100.

Budzol, Melvin: *See*—
Brubaker, Ronald L.; Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; Boyle, Frederick P.; Parkinson, Truman D.; and Rine, James C., 4,535,941, Cl. 241-21.000.

Buhler, Fritz, to Les Fils D'Auguste Scheuchzer S.A. Device for controlling a railroad track making or repairing machine. 4,535,699, Cl. 104-7.00B.

Buhren, Heinz, to W. Schlafhorst & Co. Spool separating device. 4,535,893, Cl. 209-628.000.

Buhrmann, Gerardus P.; and Steen, Adam, to Hoogovens Groep B.V. Gas-transmitting wall element for a metallurgical vessel, a metallurgical vessel having such a wall element, and a method of producing steel. 4,535,975, Cl. 266-220.000.

Bull, Jeffrey F.; and Winiasz, Michael E., to Karg, James F. Apparatus for mounting components for rotation of carriers for strand supply bobbins and for timing strand movement relative to rotation. 4,535,672, Cl. 87-29.000.

Bull, Jeffrey F.; Johnson, Harlan; Karg, James F.; and Winiasz, Michael E., to Karg, James F. Apparatus for control of moving strands from rotating strand supply bobbins. 4,535,674, Cl. 87-29.000.

Bull, Jeffrey F.; Karg, Daniel W.; and Winiasz, Michael E., to Karg, James F. Apparatus for rotating a set of carriers for a strand supply bobbin relative to moving strands from a set of contra-rotating carriers for a strand supply bobbin. 4,535,675, Cl. 87-29.000.

Bullington, Robert E.; and Discavage, James L., to Cyklop International Emil Hoffman KG. Strapping apparatus. 4,536,248, Cl. 156-502.000.

Bullock, Kenneth W.; and Story, Robert J., to Smith Berger Marine, Inc. Fish-cleaning machine finishing spray accessory. 4,535,509, Cl. 17-58.000.

Bulso, Joseph D., Jr.; Doyle, Stephen D.; and McClung, James A., to Redicon Corporation. System, method for forming containers. 4,535,618, Cl. 72-349.000.

Bundens, Allan B.: *See*—
Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., 4,536,791, Cl. 358-122.000.

Bungert, Theodor, to Hoechst Aktiengesellschaft. Pipe divider for pipes conveying solids. 4,536,104, Cl. 406-183.000.

Bungert, Theodor, to Hoechst Aktiengesellschaft. Pipe divider for pipes conveying solids or dispersions. 4,536,105, Cl. 406-183.000.

Burckardt, Karl-Heinz: *See*—
Bahr, Dietrich J.; Burckardt, Karl-Heinz; Goldrian, Gottfried; Rudolph, Volker; and Spruth, Wilhelm G., 4,536,769, Cl. 346-1.100.

Burgess, Lester E.; Fox, Karl M.; McGarry, Phillip E.; and Herman, David E., to Standard Oil Company, The. Apparatus for beneficiating coal. 4,536,372, Cl. 422-187.000.

Burgoyne, John V.; and Phalen, Thomas E., Jr., to Roofblok Limited. Roof ballast block. 4,535,579, Cl. 52-408.000.

Burkum, Merlin E.; and O'Regan, Timothy M., to Commonwealth Edison Company. Apparatus for identifying defective substation capacitors. 4,536,704, Cl. 324-52.000.

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Carlson, Walter H.; Zander, Gerald B.; Hanna, George C.; and Burmeister, Kevin L., 4,536,379, Cl. 423-345.000.

Burns, James A., to Becton, Dickinson and Company. Automatic retractable lancet assembly. 4,535,769, Cl. 128-314.000.

Burris, Lee R.; Speer, Billy L.; and Gayer, Melvin D., to Dayco Corporation. Belt tensioner and method of making the same. 4,536,172, Cl. 474-135.000.

Burron Medical Inc.: *See*—
Raines, Kenneth C., 4,535,820, Cl. 137-854.000.

Butler, David O. Unitary telephone cable closure. 4,536,611, Cl. 174-41.000.

Butler Manufacturing Company: *See*—
Domigan, Charles N., 4,536,612, Cl. 174-48.000.

Byrne, David S.: *See*—
Ferraro, Frank A.; and Byrne, David S., 4,535,537, Cl. 30-32.000.

C. A. Weidmuller GmbH & Co.: *See*—
Wilmes, Manfred, 4,536,049, Cl. 339-97.00R.

C. Reichert Optische Werke AG: *See*—
Schindl, Klaus; and Nyman, Georg, 4,536,732, Cl. 335-285.000.

Cabot Medical Corporation: *See*—
Polk, Todd J.; and Morrin, James F., 4,535,759, Cl. 128-24.00A.

Cagle, Bunyan B. Fireplace cross-circulating air heater. 4,535,752, Cl. 126-121.000.

Cagnioncle, Georges A.: *See*—
Ippolito, Serge; and Cagnioncle, Georges A., 4,535,853, Cl. 175-404.000.

Calgon Corporation: *See*—
Matz, Gary F., 4,536,292, Cl. 210-701.000.
Rey, Paul A., 4,536,186, Cl. 44-51.000.

California Linear Circuits, Inc.: *See*—
Yakura, John, 4,535,721, Cl. 118-503.000.

Calnek, Trevor A.; and Bray, John E., to NCR Canada Ltd - NCR Canada Ltee. Thermal printing apparatus. 4,536,775, Cl. 346-76.0PH.

Calspan Corporation: *See*—
Belsterling, Charles A.; and Soberman, Robert K., 4,536,690, Cl. 318-687.000.

Cambre, Cushman M.: *See*—
Hardy, Frederick E.; Kitko, David J.; and Cambre, Cushman M., 4,536,314, Cl. 252-102.000.

Cammack, Andrew S.: *See*—
Soper, Peter H. H.; and Cammack, Andrew S., 4,535,566, Cl. 51-124.00L.

Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., to Tocom, Inc. Addressable cable television control system with video format data transmission. 4,536,791, Cl. 358-122.000.

Canato, Luigi: *See*—
Bovo, Amilcare; and Canato, Luigi, 4,536,870, Cl. 370-16.000.

Canon Kabushiki Kaisha: *See*—
Ikeda, Masami; Matsuda, Hiroto; Shibata, Makoto; and Takahashi, Hiroto, 4,536,250, Cl. 156-651.000.
Kanbe, Junichiro; Shirai, Shigeru; Misumi, Teruo; Saitoh, Keishi; and Osato, Yoichi, 4,536,460, Cl. 430-57.000.
Kitagishi, Nozomu; Suzuki, Kenji; and Sakai, Shinji, 4,536,073, Cl. 354-406.000.
Kodaira, Takanori, 4,536,068, Cl. 354-195.120.
Maeda, Masaya, 4,536,805, Cl. 360-14.100.
Matsumoto, Haruyuki, 4,536,777, Cl. 346-140.0PD.
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,536,459, Cl. 430-57.000.
Nishimura, Yukuo, 4,536,061, Cl. 350-354.000.
Someya, Hiromi; Suzuki, Nobuyuki; and Mizogui, Toyokazu, 4,536,074, Cl. 354-442.000.
Sumi, Akiyasu; and Kawai, Tohru, 4,536,057, Cl. 350-318.000.
Tokuhara, Mitsuhiro, 4,536,084, Cl. 355-55.000.

Canron Inc.: *See*—
von Beckmann, Helmuth, 4,535,700, Cl. 104-12.000.

Cantatore, Giuseppe; and Cassandrini, Paolo, to Ciba-Geigy S.p.A. Process for preparing 2,2,6,6-tetramethyl-4-piperidone. 4,536,581, Cl. 546-242.000.

Capo, James L., to International Paper Company. Dual purpose carton. 4,535,928, Cl. 229-16.00R.

Capsulated Systems, Inc.: *See*—
Hart, Ronald L.; Work, Dale E.; and Davis, Colin E., 4,536,524, Cl. 523-176.000.

Carcia, Peter F., to Du Pont de Nemours, E. I., and Company. Catalyst composition. 4,536,482, Cl. 502-5.000.

Cardaio, Rino: *See*—
Mauri, Luigi; and Cardaio, Rino, 4,536,453, Cl. 428-484.000.

Cardis, James C.; and Inciong, Josefino T., to Felt Products Mfg. Co. Gasket assembly for oil pans and the like and method of making same. 4,535,996, Cl. 277-1.000.

Carena, Ugo; and Rivera, Paolo, to Ing. C. Olivetti & C., S.p.A. Optical transducer with a transparent shutter disk. 4,536,650, Cl. 250-231.0SE.

Carlson, Walter H.; Zander, Gerald B.; Hanna, George C.; and Burmeister, Kevin L., to Graphite Sales, Inc. Production of silicon carbide. 4,536,379, Cl. 423-345.000.

Carlsson, Lars-Olof, to Abu Aktiebolag. Bail operating mechanism for fishing reels. 4,535,952, Cl. 242-84.20G.

Carobbi, Renato; Miletti, Sandro; and Franci, Vittorio, to SIRAC Spa. Process for preparing lactulose from lactose, in the form of a syrup or a crystalline product. 4,536,221, Cl. 127-30.000.

Carrier Corporation: *See*—
Herb, Carl C., 4,535,932, Cl. 236-49.000.
Mount, Gordon L., 4,535,598, Cl. 62-126.000.
Mount, Gordon L., 4,535,607, Cl. 62-201.000.

Carson, Don B., to UOP Inc. Hydrogen conservation in hydrogen recycle hydroconversion processes. 4,536,276, Cl. 208-100.000.

Carter, A. Franklin. Animal feed method employing natamycin. 4,536,494, Cl. 514-31.000.

Cartz, Louis: *See*—
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,536,884, Cl. 378-119.000.

Case, Robert F.: *See*—
Roes, John B.; Kelly, Guy M.; Case, Robert F.; and Demirg, Chandler R., 4,535,892, Cl. 209-3.300.

Casio Computer Co., Ltd.: *See*—
Kaneko, Youji, 4,535,669, Cl. 84-1.260.

Cassandrini, Paolo: *See*—
Cantatore, Giuseppe; and Cassandrini, Paolo, 4,536,581, Cl. 546-242.000.

Castel, John C., to Physio Technology, Inc. Method of providing electrical stimulation of tissue. 4,535,777, Cl. 128-421.000.

Castellano, Vincenzo: *See*—
Bergen, Henry M.; Zaimi, Sedat; Castellano, Vincenzo; and Schildkraut, Irwin, 4,536,621, Cl. 179-99.00R.

Caterpillar Tractor Co.: *See*—
Chambers, Robert O., 4,535,651, Cl. 74-711.000.
Kohler, Ramon C., 4,535,646, Cl. 74-501.00R.

Cattin, Francois, to Fluckiger & Huguenin S.A. Instrument for the treatment of dental canals. 4,536,156, Cl. 433-102.000.

Cauthron, Grover L.; and Veatch, Michael W. Animal spraying apparatus. 4,535,726, Cl. 119-159.000.

Cavalli, Alfredo. Steam ironing apparatus with a separate water reservoir. 4,535,556, Cl. 38-77.600.

Cavalli, Alfredo. Machine for making ice cream and similar cold products, hacing a removable ice cream-making vessel. 4,535,604, Cl. 62-342.000.

Cayless, Richard A.; and Thukral, Prem S., to British Petroleum Company p.l.c., The. Surface treatment of metal. 4,536,225, Cl. 148-6.15R.

Celanese Corporation: *See*—
Shearer, Wilfred L.; Sinker, Stephen M.; and Wolf, Richard A., 4,536,527, Cl. 524-193.000.

Celedata Corporation: *See*—
Adams, C. Harris; and Farnsworth, Robert P., 4,536,646, Cl. 235-377.000.

Centre de Recherches Metallurgiques Centrum Voor: *See*—
Crahay, Jean R., 4,536,639, Cl. 219-121.0LU.

Cerf, Olivier: *See*—
Gervais, Alain; Vermeire, Daniel; Cerf, Olivier; and Toux, Jacques, 4,535,621, Cl. 73-59.000.

Cerimon: *See*—
Petraud, Gilles, 4,535,555, Cl. 37-94.000.

Ceskoslovenska akademie ved: *See*—
Rohlicek, Vojtech; Hruby, Jaroslav; Nohavica, Dusan; Hrdlicka, Jan; Vykouk, Vlastimil; and Kubec, Frantisek, 4,535,784, Cl. 128-735.000.

Ceskoslovenska akademie ved of Praha: *See*—
Loth, Fritz; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,536,217, Cl. 106-122.000.

CGEE Alsthom: *See*—
Godfroid, Henri, 4,536,692, Cl. 318-723.000.

Chamberlain Manufacturing Corporation: *See*—
Prine, David W., 4,535,629, Cl. 73-587.000.

Chambers, Robert O., to Caterpillar Tractor Co. Torque proportioning differential. 4,535,651, Cl. 74-711.000.

Champion Spark Plug S.A.: *See*—
Verton, Jose ; and Henrion, Alain, 4,535,500, Cl. 15-250.230.

Chan, David M. F.; and Chan, Michael L. F. Object holding device for decorative structure. 4,535,962, Cl. 248-214.000.

Chan, Michael L. F.: *See*—
Chan, David M. F.; and Chan, Michael L. F., 4,535,962, Cl. 248-214.000.

Chan, Ven L., to Black & Decker, Inc. Iron with overtemperature protection means. 4,536,641, Cl. 219-253.000.

Chandler, Jasper S.; and Geyer, Frederick F., to Eastman Kodak Company. Optical disk assembly. 4,536,869, Cl. 369-287.000.

Chant, Bernard J.: *See*—
Mookherjee, Braja D.; Chant, Bernard J.; Evers, William J.; Wilson, Richard A.; Zampino, Michael J.; and Vock, Manfred H., 4,536,583, Cl. 549-1.000.

Chapline, George F., Jr., to United States of America, Energy. Method and apparatus for molecular imaging using X-rays at resonance wavelengths. 4,536,883, Cl. 378-36.000.

Charbonnages de France: *See*—
Ippolito, Serge; and Cagnioncle, Georges A., 4,535,853, Cl. 175-404.000.

Charbonnier, Roger, to Adret Electronique. Low noise crystal oscillator. 4,536,721, Cl. 331-116.00R.

Charles C. Worth Corporation: *See*—
Worth, Charles C.; and Young, John N., 4,535,954, Cl. 242-84.52B.

Charles, John G.: *See*—
Settineri, William J.; Charles, John G.; Hinkel, Jerald J.; and Malone, Bradley P., 4,536,222, Cl. 134-5.000.

Chauviere, Henri, to Etudes Techniques et Representations Industrielles E.T.R.I. Part to be assembled and sub-assembly comprising said part and a nut. 4,536,100, Cl. 403-12.000.

Cheal, James; and Fitzsimons, James R., to Southwest Microwave. Intrusion detection system and method. 4,536,752, Cl. 340-554.000.

Chemical Research & Licensing Company: *See*—
Jones, Edward M., Jr., 4,536,373, Cl. 422-211.000.

Chemische Werke Huels, A.G.: *See*—
Stutzel, Bernhard, 4,536,548, Cl. 525-227.000.

Chen, Augustin T.; Goldwasser, David J.; and Onder, Kemal, to Upjohn Company, The. Product. 4,536,533, Cl. 524-161.000.

Chen, C. Gregory: *See*—
Theisen, Peter J.; and Chen, C. Gregory, 4,536,814, Cl. 361-7.000.

Chen, Devereaux C.; and Fu, Horng-Sen, to Hewlett-Packard Company. Method for improving reflow of phosphosilicate glass by arsenic implantation. 4,535,528, Cl. 29-571.000.

Chiang, Anne; and Meuli, William P., to Xerox Corporation. Method for eliminating laser-induced substrate fissures associated with crystallized silicon areas. 4,536,251, Cl. 156-657.000.

Chin, Danny: *See*—
Maturo, Robert J.; Chin, Danny; and Henderson, John G. N., 4,536,797, Cl. 358-192.100.

Chin, Robert W.: *See*—
Bischoff, Andrea L.; and Chin, Robert W., 4,535,957, Cl. 244-103.00R.

Chisso Corporation: *See*—
Sugimori, Shigeru; Kojima, Tetsuhiko; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,536,321, Cl. 252-299.630.

Chlanda, Frederick P.; and Mani, Krishnamurthy N., to Allied Corporation. Multichamber two-compartment electrodialytic water splitter and method of using same for acidification of aqueous soluble salts. 4,536,269, Cl. 204-182.400.

Cho, Chun S. Shoe polishing device and servo-applicator means for use therein. 4,535,499, Cl. 15-24.000.

Christensen, Richard G.: *See*—
Amendola, Albert; Christensen, Richard G.; and Yereance, John G., Jr., 4,536,470, Cl. 430-314.000.

Christensen, Thorkild: *See*—
Thomsen, Svend E.; and Christensen, Thorkild, 4,535,678, Cl. 91-29.000.

Ciba-Geigy Corporation: *See*—
Browne, Leslie J., 4,536,505, Cl. 514-339.000.
Falk, Robert A.; and Borsodi, Istvan, 4,536,254, Cl. 162-135.000.
Lapple, Arnulf R.; and Nicopoulos, Alex, 4,536,185, Cl. 8-527.000.
Nachbur, Hermann; and Tempel, Christel, 4,536,779, Cl. 346-212.000.
Orban, Ivan; and Troxler, Eduard, 4,536,593, Cl. 560-75.000.

Ciba-Geigy S.p.A.: *See*—
Cantatore, Giuseppe; and Cassandrini, Paolo, 4,536,581, Cl. 546-242.000.

Cincinnati Milacron Inc.: *See*—
Borisch, Donald J.; Hanrahan, Gary V.; and Merritt, Herbert E., 4,536,849, Cl. 364-550.000.
Smith, Roger D., 4,536,150, Cl. 425-526.000.

Citizen Watch Company Limited: *See*—
Yoshida, Masaru, 4,536,093, Cl. 368-187.000.

Claren, Jan S.; Jeppsson, Jan-Bertil; and Staehr, Peter R., to Gambro Lundia AB. Pressure measuring system. 4,535,635, Cl. 73-756.000.

Clark, Brian, to Schlumberger Technology Corporation. Shields for antennas of borehole logging devices. 4,536,714, Cl. 324-338.000.

Clark Equipment Company: *See*—
Mather, Joseph M.; and Albright, Larry E., 4,535,868, Cl. 180-297.000.

Clark, Richard E., to Continental Packaging Company, Inc. Intermediate article of manufacture for a plastic container. 4,535,902, Cl. 215-1.00C.

Clarke, John E.: *See*—
Baker, Donn; Clarke, John E.; and Johnson, Chris G., 4,536,052, Cl. 339-126.00R.

Cleveland, William C., Jr.: *See*—
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,535,961, Cl. 248-183.000.

Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; Mackinnon, John W. M.; Judd, Duncan B.; and Hayes, Roger, to Glaxo Group Limited. Triazoleamine derivatives having histamine H_2-antagonist properties. 4,536,508, Cl. 514-383.000.

Coad, Brian C., to GTE Products Corporation. Boron addition to alloys. 4,536,215, Cl. 75-129.000.

Coates, Ronald: *See*—
O'Grady, Thomas M.; Tatterson, David F.; and Coates, Ronald, 4,536,277, Cl. 208-11.00R.

Tatterson, David F.; O'Grady, Thomas M.; and Coates, Ronald, 4,536,278, Cl. 208-11.00R.
Coburn, Brian. Ratio speed adaptor. 4,535,653, Cl. 74-765.000.
Cocentall - Ateliers de Carspach: *See*—
Ippolito, Serge; and Cagnioncle, Georges A., 4,535,853, Cl. 175-404.000.
Cocivera, Michael, to University of Guelph. Thin film cadmium selenide electrodeposited from selenosulphite solution. 4,536,260, Cl. 204-37.100.
Coffey, Gerald P., to Standard Oil Company, The. Process for preparing substantially linear polyamides from acrylamide and aqueous ammonia. 4,536,566, Cl. 528-363.000.
Coin Controls Limited: *See*—
Bellis, Robert D.; Tod, Timothy W.; and Tod, Roger J., 4,535,794, Cl. 133-8.00E.
Cole National Corporation: *See*—
Sorrells, Frank D., 4,535,575, Cl. 51-216.0LP.
Coleman, Thomas E.: *See*—
Ingram, Wayne A.; Johnson, Stephen L.; and Coleman, Thomas E., 4,536,823, Cl. 361-355.000.
Colgate-Palmolive Company: *See*—
Bonk, Joseph P., 4,535,912, Cl. 221-46.000.
Ramachandran, Pallassanna; and Grand, Paul S., 4,536,315, Cl. 252-174.110.
Ramachandran, Pallassanna, 4,536,316, Cl. 252-174.110.
Collins, Gregory P., to Mobil Oil Corporation. Method of plasma treating a polymer film to change its properties. 4,536,271, Cl. 204-192.00E.
Collins, Paul W.; Gasiecki, Alan F.; and Weier, Richard M., to G. D. Searle & Co. 2-Substituted prostaglandins. 4,536,592, Cl. 560-53.000.
Collyear, John G.; and Parker, David A., to AE PLC. Pistons. 4,535,682, Cl. 92-153.000.
Colorado School of Mines: *See*—
Penning, Francis A., 4,535,541, Cl. 33-1.00H.
Combs, L. Paul: *See*—
Sprouse, Kenneth M.; Schuman, Merlin D.; and Combs, L. Paul, 4,536,603, Cl. 585-539.000.
Commissariat a l'Energie Atomique: *See*—
Bruel, Michel, 4,536,657, Cl. 250-492.200.
Fiori, Robert; Seyfried, Philippe; and Symard, Jose , 4,535,666, Cl. 83-795.000.
Leclercq, Joseph, 4,535,523, Cl. 29-402.080.
Commonwealth Edison Company: *See*—
Burkum, Merlin E.; and O'Regan, Timothy M., 4,536,704, Cl. 324-52.000.
Commonwealth of Australia, The: *See*—
Hill, John W., 4,535,716, Cl. 114-221.00R.
Compagnie Europeenne de Teletransmission C.E.T.T.: *See*—
Tonello, Marc, 4,536,748, Cl. 340-506.000.
Compagnie Francaise d'Enterprises Metalliques: *See*—
Laplante, Gilbert, 4,535,971, Cl. 254-108.000.
Computer Services Corporation: *See*—
Takiguchi, Kiyoaki; and Takano, Seigo, 4,535,895, Cl. 209-683.000.
Comus International Corp.: *See*—
Romano, Robert P., 4,536,727, Cl. 335-54.000.
Conde, Henry. Impact absorbing parking space barrier. 4,535,974, Cl. 256-1.000.
Continental Can Company: *See*—
Hekal, Ihab M., 4,536,425, Cl. 428-35.000.
Continental Packaging Company, Inc.: *See*—
Clark, Richard E., 4,535,902, Cl. 215-1.00C.
Cook, Linda E. Sanitary napkin with improved protection. 4,536,181, Cl. 604-387.000.
Cook, Thomas E. Process and apparatus for removing adsorbed material from an adsorber. 4,536,197, Cl. 55-28.000.
Cook, Thomas E.; and Llenado, Ramon A., to Procter & Gamble Company, The. Foaming surfactant compositions. 4,536,318, Cl. 252-174.170.
Cooks, Graham; Story, Michael S.; Jung, Gerhard; and Dobberstein, Peter, to Finnigan Mat GmbH. Hybrid mass spectrometer. 4,536,652, Cl. 250-281.000.
Cooper Industries, Inc.: *See*—
Maros, Ronald R., 4,536,053, Cl. 339-143.00R.
Cornell, Howell N., to Keller Industries, Inc. Folding chair. 4,536,026, Cl. 297-39.000.
Cornet, Jean: *See*—
Lange , Francois; and Cornet, Jean, 4,536,868, Cl. 369-284.000.
Corning Glass Works: *See*—
Flannery, James E.; Stempin, John L.; and Wexell, Dale R., 4,536,480, Cl. 501-32.000.
Flannery, James E.; Stempin, John L.; and Wexell, Dale R., 4,536,481, Cl. 501-32.000.
Stempin, John L.; and Wexell, Dale R., 4,536,452, Cl. 428-433.000.
Corral, Allan B.: *See*—
Duder, Richard A.; and Corral, Allan B., 4,535,810, Cl. 137-596.170.
Corrigan, Francis R.: *See*—
Bovenkerk, Harold P.; Gigl, Paul D.; and Corrigan, Francis R., 4,536,442, Cl. 428-323.000.
Cosden Technology, Inc.: *See*—
Murley, Jackie D.; and Johnson, Marion, 4,536,148, Cl. 425-387.100.
Cotton, Austin H.: *See*—
Bickerstaff, Alan E.; Cotton, Austin H.; Ladell, Michael G.; and Neale, David M., 4,536,076, Cl. 355-3.0FU.
Coty, Raymond J. A. Automatic larvicide dispenser. 4,535,914, Cl. 222-52.000.
Coue, Maurice E. L., to Huret et ses Fils. Lever unit in particular for a cycle. 4,535,644, Cl. 74-489.000.
Coulson, Richard L.: *See*—
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,536,836, Cl. 364-200.000.
Courtis, Andrew: *See*—
Ballard, Denis G. H.; Courtis, Andrew; and Shirley, Ian M., 4,536,555, Cl. 526-295.000.
Couture, Joseph W., to Black Clawson Company, The. Pulping apparatus including a rotor and helical screw flights extending upwardly from the rotor. 4,535,943, Cl. 241-46.020.
Cowan, William P. Board game apparatus. 4,535,994, Cl. 273-256.000.
CPC International Inc.: *See*—
Katkocin, Dennis M.; Word, Nancy S.; and Yang, Shiow-Shong, 4,536,477, Cl. 435-205.000.
Cragoe, Edward J., Jr.: *See*—
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., 4,536,507, Cl. 514-362.000.
Crahay, Jean R., to Centre de Recherches Metallurgiques Centrum Voor. Regulating surface treatment by laser beam. 4,536,639, Cl. 219-121.0LU.
Cranford, Hayden C., Jr.; and Garvin, Stacy J., to International Business Machines Corporation. Programmable oscillator with power down feature and frequency adjustment. 4,536,720, Cl. 331-57.000.
Crepaco, Inc.: *See*—
Thomas, Edward B.; and Peters, Mark C., 4,535,836, Cl. 165-86.000.
Creusot-Loire: *See*—
Katz, Maurice, 4,535,998, Cl. 277-212.0FB.
Cromie, Harry W.: *See*—
Klawitter, Jerome J.; and Cromie, Harry W., 4,535,483, Cl. 623-2.000.
Crounse, Nathan N., to Hilton-Davis Chemical Co., The. N-Aminoalkylenesulfonamido substituted disazo colorants. 4,536,570, Cl. 534-819.000.
Crown Metal Mfg. Company: *See*—
Varon, David; Dorner, Steven C.; and Siegal, Burton L., 4,535,525, Cl. 29-463.000.
Cubic Western Data: *See*—
Roes, John B.; Kelly, Guy M.; Case, Robert F.; and Deming, Chandler R., 4,535,892, Cl. 209-3.300.
Culligan International Company: *See*—
DeVale, Donald P.; and Rak, Stanley F., 4,536,845, Cl. 364-500.000.
Cunningham, Richard D., to InterNorth, Inc. Method for automatically measuring the amount of water in a natural gas pipeline with the aid of a computer controlled gas chromatograph. 4,535,620, Cl. 73-23.100.
Currie, Robert J.: *See*—
Rattlingourd, Glen D.; Currie, Robert J.; and Moss, Stanley D., 4,536,878, Cl. 371-43.000.
Curtis, Paul T.: *See*—
Bishop, Sarah M.; and Curtis, Paul T., 4,536,438, Cl. 428-246.000.
Custer, Donald J., to Morgan Construction Company. Means for sensing an undesirable approach angle in a level wind coiler. 4,535,955, Cl. 242-158.00R.
Cyklop International Emil Hoffman KG: *See*—
Bullington, Robert E.; and Discavage, James L., 4,536,248, Cl. 156-502.000.
Cyrot, Luc P., to International Telephone & Telegraph Corp. Valve solenoid windings. 4,536,728, Cl. 335-182.000.
D&M Investments: *See*—
Darr, Harry W., 4,535,754, Cl. 126-419.000.
Dabich, Robert M. Double hinge counter-weight cover assembly. 4,535,908, Cl. 220-18.000.
Daddona, Anthony D.: *See*—
Wuthrich, Paul; Daigle, Lyman R.; and Daddona, Anthony D., 4,536,095, Cl. 368-321.000.
Dagna, Gian D.: *See*—
Knirsch, Franco; Gianolini, Giovanni; Dagna, Gian D.; and Buat, Mario, 4,536,776, Cl. 346-140.00R.
Dahlberg, Bengt A. G.: *See*—
Brorsson, Fritz L.; Dahlberg, Bengt A. G.; and Holmberg, Bengt M., 4,536,201, Cl. 55-189.000.
Daicel Chemical Industries, Ltd.: *See*—
Okitsu, Kiyoshi; and Go, Hiroyouki, 4,536,563, Cl. 528-279.000.
Daido Metal Company Ltd.: *See*—
Iijima, Yoshio, 4,535,517, Cl. 29-156.50A.
Daigle, Lyman R.: *See*—
Wuthrich, Paul; Daigle, Lyman R.; and Daddona, Anthony D., 4,536,095, Cl. 368-321.000.
Dainippon Ink and Chemicals, Inc.: *See*—
Kamei, Masayuki; Endo, Tomio; and Hashimoto, Yutaka, 4,536,298, Cl. 252-8.050.
Yasui, Toshihiko; Matsumoto, Tetsuo; and Akaike, Akihiko, 4,536,468, Cl. 430-296.000.
Dainippon Pharmaceutical Co., Ltd.: *See*—
Tukamoto, Masatoshi; and Sawayama, Tadahiro, 4,536,601, Cl. 564-355.000.
Daiwa Golf Co., Ltd.: *See*—
Yamada, Magoichi, 4,535,990, Cl. 273-173.000.
Daldosch, Johannes: *See*—
Hooie, David W.; and Daldosch, Johannes, 4,535,913, Cl. 221-251.000.

Dalla Lana, Ivo G.: *See*—
Wanke, Sieghard E.; Rangwala, Huseni A.; Otto, Fred D.; Dalla Lana, Ivo G.; Paterson, Linda M.; and Rolston, John H., 4,536,488, Cl. 502-159.000.

Dalliard, Fernand: *See*—
Hess, Fritz; and Dalliard, Fernand, 4,535,702, Cl. 105-4.00R.

Dam, Poul S.: *See*—
Jacobsen, Finn; Molbaek, Jens J.; Zangenberg, Jan; and Dam, Poul S., 4,535,590, Cl. 60-531.000.

Dan, Takuya; and Fujita, Akio, to Bridgestone Tire Co., Ltd. Rubber vibration isolators. 4,535,976, Cl. 267-8.00R.

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Jacobsen, Finn; Molbaek, Jens J.; Zangenberg, Jan; and Dam, Poul S., 4,535,590, Cl. 60-531.000.
Thomsen, Svend E.; and Christensen, Thorkild, 4,535,678, Cl. 91-29.000.

Daniell, Alan F., to Fluor Corporation. Transfer apparatus and method. 4,535,900, Cl. 212-193.000.

Danneberg, Peter: *See*—
Engel, Wolfhard; Bauer, Eckhart; Trummlitz, Gunter; Danneberg, Peter; and Kahling, Joachim, 4,536,402, Cl. 514-443.000.

Darlington, R. Keith: *See*—
Augsburger, John J.; and Darlington, R. Keith, 4,536,302, Cl. 252-8.55R.

Darr, Harry W., to D&M Investments. Manufactured fuel assisted solar heat exchanger. 4,535,754, Cl. 126-419.000.

Das, Jagabandhu; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted prostaglandin interphenylene analogs useful in the treatment of thrombolytic disease. 4,536,513, Cl. 514-469.000.

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Allen, Richard M.; Arnold, Jeffrey M.; Field, Joseph J.; and Spraker, Terry E., 4,536,770, Cl. 346-29.000.

Dautzenberg, Horst: *See*—
Loth, Fritz; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,536,217, Cl. 106-122.000.

David, Constant V. Training and care apparatus for horses. 4,535,724, Cl. 119-29.000.

Davidson, Dale D., to Sperry Corporation. Servomotor feedback fault detector. 4,536,689, Cl. 318-565.000.

Davis, Charles S., to Knoll International, Inc. Lighting fixture utilizing a multi-layered hologram as a lens element. 4,536,833, Cl. 362-293.000.

Davis, Colin E.: *See*—
Hart, Ronald L.; Work, Dale E.; and Davis, Colin E., 4,536,524, Cl. 523-176.000.

Davis, Curry B.; and Frade, Americo G. P., to Arizona Chemical Company. Tall'oil fatty acids-quality improvement. 4,536,332, Cl. 260-97.600.

Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 1-[3-(6-Fluoro-1,2-benzisoxazol-3-yl)propyl]-4-(substituted)-piperazines. 4,536,578, Cl. 544-360.000.

Davis, Mark H.; Meador, Richard A.; and Wisler, Macmillan M., to NL Industries, Inc. Electrical resistivity measurement of a flowing drilling fluid using eddy currents generated therein. 4,536,713, Cl. 324-324.000.

Davis, Thomas A., to Exxon Research and Engineering Co. Integrated process for deasphalting heavy oils using a gaseous antisolvent. 4,536,283, Cl. 208-309.000.

Dayco Corporation: *See*—
Burris, Lee R.; Speer, Billy L.; and Gayer, Melvin D., 4,536,172, Cl. 474-135.000.

Dayton, Birney D., to Grass Valley Group, Inc., The. Circuit for converting two balanced ECL level signals into an inverted TTL level signal. 4,536,665, Cl. 307-475.000.

De-La-Concha-Caceres, Alfonso, to Free Motion Designs Corporation. Recreational device for producing the thrill of a free fall. 4,535,983, Cl. 272-6.000.

De Bisschop, James; Neri, Anthony A.; and Williams, Thomas J., to Torrington Company, The. Vehicle steering sub-assembly. 4,535,645, Cl. 74-492.000.

De Bondt, Werner E.: *See*—
De Schamphelaere, Lucien A.; De Cock, Etienne M.; De Bondt, Werner E.; Librecht, Freddy M.; Boeve, Gerard J.; and Van Peteghem, Willy F., 4,536,778, Cl. 346-160.000.

De Cock, Etienne M.: *See*—
De Schamphelaere, Lucien A.; De Cock, Etienne M.; De Bondt, Werner E.; Librecht, Freddy M.; Boeve, Gerard J.; and Van Peteghem, Willy F., 4,536,778, Cl. 346-160.000.

Deeba, Michael, to Air Products and Chemicals, Inc. Amination of olefins using organic acid catalysts. 4,536,602, Cl. 564-485.000.

Deere & Company: *See*—
Faylor, Lawrence E., 4,535,729, Cl. 123-41.100.
Waggoner, Van E., 4,535,860, Cl. 180-24.050.

Deex, Oliver D., to Monsanto Company. Liquid crystalline polyesters. 4,536,562, Cl. 528-193.000.

Degussa Aktiengesellschaft: *See*—
Beyer, Hans-Hermann; Baudis, Ulrich; Biberbach, Peter; and Weber, Wolfgang, 4,536,224, Cl. 148-6.110.
Kaufmann, Lothar; and Hellwig, Klaus-Dieter, 4,536,383, Cl. 423-508.000.

Del Norte Technology, Inc.: *See*—
Parker, William H., 4,536,753, Cl. 340-566.000.

Delalande S.A.: *See*—
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Santamaria, Raphael, 4,536,500, Cl. 514-212.000.
Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., 4,536,580, Cl. 546-124.000.

Delaval Turbine Inc.: *See*—
Tetro, Roland G., 4,536,660, Cl. 307-118.000.

De Marco, Claudio: *See*—
Besson, Duilio; De Marco, Claudio; Peruzzo, Roberto; and Ardit, Giuseppe, 4,535,599, Cl. 62-154.000.

Deming, Chandler R.: *See*—
Roes, John B.; Kelly, Guy M.; Case, Robert F.; and Deming, Chandler R., 4,535,892, Cl. 209-3.300.

Denda, Masahiko; Sato, Shinichi; Tsubouchi, Natsuro; Kinoshita, Shigeji; and Ohbayashi, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Process for manufacturing a semiconductor memory device. 4,535,530, Cl. 29-571.000.

Dennison Manufacturing Co.: *See*—
Magnotta, Frank A., 4,536,434, Cl. 428-200.000.

deNora, Oronzio; and Spaziante, Placido M., to Oronzio deNora Impianti Elettrochimici S.p.A. Process for generating halogen using novel electrolysis cell. 4,536,263, Cl. 204-98.000.

d'Entremont, Alice M.; and Freeman, William T., to Polaroid Corporation. Method and apparatus for colored computer graphic photography. 4,536,848, Cl. 364-526.000.

De Obaldia B., Marcos G. Molded footwear. 4,535,554, Cl. 36-113.000.

DePasquale, Michael; and Adam, William S. Pressure indicator and alarm. 4,536,756, Cl. 340-626.000.

Derderian, Thomas; Frederick, Edward C.; and Gross, Alexander L., to Nike, Inc. Shock absorbing sole layer. 4,535,553, Cl. 36-28.000.

Dermatological Enterprises, Ltd.: *See*—
Bernstein, Joel E., 4,536,404, Cl. 424-324.000.

De Schamphelaere, Lucien A.; De Cock, Etienne M.; De Bondt, Werner E.; Librecht, Freddy M.; Boeve, Gerard J.; and Van Peteghem, Willy F., to AGFA-Gevaert N.V. Recording apparatus with modular LED array of higher production yield. 4,536,778, Cl. 346-160.000.

Deschamps, Patrice P. M.; Gallo, Roger; and Grangette, Henri, to Elf France. Process for the preparation of beta-disubstituted monocarboxylic acids. 4,536,594, Cl. 562-400.000.

Dettelbach, Alfred; and Gresser, Gerhard, to REICH Spezialmaschinen GmbH. Sanding tool and method of making such tool. 4,535,574, Cl. 51-204.000.

Dettelbach, Alfred; Gresser, Gerhard; and Einsele, Gerhard, to Reich Spezialmaschinen GmbH. Apparatus for molding a profiled body. 4,535,965, Cl. 249-83.000.

Deutsch, Emory, to North American Philips Corporation. Capacitor with a heat sink core. 4,536,819, Cl. 361-274.000.

DeVale, Donald P.; and Rak, Stanley F., to Culligan International Company. Self-programmable controller for water conditioner recharging. 4,536,845, Cl. 364-500.000.

de Witt, Clinton J.; and Reese, Ron. Alcohol compositions having luminous flames. 4,536,188, Cl. 44-53.000.

Diamond Shamrock Chemicals Company: *See*—
Papadakis, Nicholas; and Kalynchuk, Daniel G., 4,536,274, Cl. 204-433.000.

Diamonstein, Arthur, to Paramount Industrial Companies, Inc. Slat type mattress foundation. 4,535,494, Cl. 5-400.000.

Dicke, Hans-Rudolf: *See*—
Schmidt, Manfred; and Dicke, Hans-Rudolf, 4,536,561, Cl. 528-191.000.

Dicken Manufacturing Company: *See*—
Johanson, Leonard T.; and Forrester, Harry L., 4,535,808, Cl. 137-543.000.

Diehl GmbH & Co.: *See*—
Politzer, Anton; and Bertiller, Roland, 4,535,676, Cl. 89-14.100.

Diehl, Werner K.: *See*—
Farrell, W. James; and Diehl, Werner K., 4,536,110, Cl. 409-11.000.

Diery, Helmut: *See*—
Ritschel, Werner; Diery, Helmut; and Hille, Martin, 4,536,339, Cl. 260-404.500.

Dietrich, William J., Sr., to DMI, Inc. Implement with horizontal linkage depth control. 4,535,849, Cl. 172-468.000.

Digital Equipment Corporation: *See*—
Sidman, Michael, 4,536,809, Cl. 360-77.000.

Dikoff, Joseph K. Golf tool. 4,535,987, Cl. 273-32.00B.

Diller, Robert W., to Technar, Incorporated. Gas damped acceleration switch. 4,536,629, Cl. 200-61.45R.

DiMassimo, Donald V.; May, John B.; and Lemmon, Michael D., to General Electric Company. Multi-format data display. 4,536,759, Cl. 340-706.000.

Dines, David R.; Svoboda, George; and Workman, Robert G., to AT&T Technologies, Inc. Methods and apparatus for assembling permutations of elements into or onto articles. 4,535,535, Cl. 29-845.000.

Discavage, James L.: *See*—
Bullington, Robert E.; and Discavage, James L., 4,536,248, Cl. 156-502.000.

Dischert, William A., to RCA Corporation. Method and apparatus for aligning a chuck for holding an information containing disc stylus. 4,536,238, Cl. 156-64.000.

Discovery Concepts, Inc.: *See*—
Ziegelheim, Irwin I.; and Lerner, Lawrence, 4,536,044, Cl. 312-257.00R.

Discovision Associates: *See*—
Giddings, Gary M., 4,536,863, Cl. 369-43.000.
Hyde, James L., 4,535,548, Cl. 34-4.000.

DMI, Inc.: *See*—
Dietrich, William J., Sr., 4,535,849, Cl. 172-468.000.
Dobberstein, Peter: *See*—
Cooks, Graham; Story, Michael S.; Jung, Gerhard; and Dobberstein, Peter, 4,536,652, Cl. 250-281.000.
Dr. Ing. h.c.F. Porsche A.G.: *See*—
Schutz, Matthias; Sivers, Rolf V.; Roesems, Dirk; and Rebmann, Rolf, 4,535,964, Cl. 248-607.000.
Dr. -Ing. Rudolf Hell GmbH: *See*—
Hennig, Eberhard, 4,536,803, Cl. 358-299.000.
Dr. Karl Thomae Gesellschaft mit beschranter Haftung: *See*—
Engel, Wolfhard; Bauer, Eckhart; Trummlitz, Gunter; Danneberg, Peter; and Kahling, Joachim, 4,536,402, Cl. 514-443.000.
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., to Storage Technology Corporation. Detection of sequential data stream. 4,536,836, Cl. 364-200.000.
Doddington, George R.: *See*—
Papamichalis, Panos E.; and Doddington, George R., 4,536,886, Cl. 381-41.000.
Domigan, Charles N., to Butler Manufacturing Company. Box for raised floors. 4,536,612, Cl. 174-48.000.
Donaldson, Jack J., to Mobil Oil Corporation. Method for producing longitudinally ribbed plastic film. 4,536,362, Cl. 264-171.000.
Doney, Alfred D.: *See*—
Holzgang, Curtis R.; Leavitt, Mark K.; Doney, Alfred D.; and Kuehn, James, 4,536,755, Cl. 340-573.000.
Donn Incorporated: *See*—
Shirey, Richard, 4,535,580, Cl. 52-484.000.
Donner, Meinrad: *See*—
Mesey, Milton; Shcwaighofer, Roman; and Donner, Meinrad, 4,535,573, Cl. 51-165.870.
Dorler, Jack A.: *See*—
Bhatia, Harsaran S.; Dorler, Jack A.; Gaur, Santosh P.; Lechaton, John S.; Mosley, Joseph M.; and Srinivasan, Gurumakonda R., 4,535,531, Cl. 29-577.00C.
Dorner, Steven C.: *See*—
Varon, David; Dorner, Steven C.; and Siegal, Burton L., 4,535,525, Cl. 29-463.000.
Dorr, William C.; Hybarger, Kenneth C.; and Yurkinas, James A., to Kent Products, Inc. Vehicle tire carrier. 4,535,973, Cl. 254-323.000.
Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., to Delalande S.A. 4-Amino-5-bromo-2-methoxy-N-[8-(benzyl)]-8-azabicyclo[3.2.1]-3-YL-benzamide or a pharmacologically acceptable acid addition salt thereof. 4,536,580, Cl. 546-124.000.
Douglas, Ellwood S.: *See*—
Mosher, Oren A.; and Douglas, Ellwood S., 4,535,856, Cl. 177-1.000.
Douta, Kikuo: *See*—
Matsuzawa, Toshiharu; Douta, Kikuo; Iwayanagi, Takao; and Yanazawa, Hiroshi, 4,536,421, Cl. 427-282.000.
Dow Chemical Company, The: *See*—
Fellmann, Jere D.; Garrou, Philip E.; Withers, Howard P., *Jr.*; and Seyferth, Dietmar, 4,536,589, Cl. 556-14.000.
Killat, George R.; and Wilson, Larry R., 4,536,552, Cl. 525-451.000.
Price, Robert W., 4,535,803, Cl. 137-375.000.
Rigterink, Raymond H.; and Sbragia, Ronald J., 4,536,341, Cl. 260-453.0AR.
Settineri, William J.; Charles, John G.; Hinkel, Jerald J.; and Malone, Bradley P., 4,536,222, Cl. 134-5.000.
Turner, James A., 4,536,208, Cl. 71-94.000.
Woo, Edmund P., 4,536,564, Cl. 528-341.000.
Dowley Manufacturing, Inc.: *See*—
Eason, Lloyd R., 4,535,616, Cl. 72-116.000.
Downey, Holmes A., to Reliance Electric Company. Elastomeric shear shaft coupling. 4,536,170, Cl. 464-80.000.
Downing, Gerald T.; and Gyllstrom, Gregory W., to W. H. Brady Co. Cable clamp with alignment means. 4,535,960, Cl. 248-74.500.
Dowty Hydraulic Units Limited: *See*—
Bick, David E.; Flippance, Christopher F.; and Parry, Ian C., 4,535,872, Cl. 188-62.000.
Doyle, Patrick. Bar or rod or tube frame multi-position assembly clamp. 4,536,102, Cl. 403-390.000.
Doyle, Stephen D.: *See*—
Bulso, Joseph D., Jr.; Doyle, Stephen D.; and McClung, James A., 4,535,618, Cl. 72-349.000.
Drackett Company, The: *See*—
Rowekamp, Patricia A., 4,535,906, Cl. 215-329.000.
Stopper, Howard R., 4,536,323, Cl. 252-305.000.
Drag Specialties, Inc.: *See*—
Stahel, Alwin J., 4,535,649, Cl. 74-551.900.
Dragerwerk Aktiengesellschaft: *See*—
Baum, Marcel, 4,535,766, Cl. 128-204.230.
Hahn, Rainer, 4,536,370, Cl. 422-120.000.
Schmidt, Martin; and Hattendorff, Horst D., 4,536,090, Cl. 356-414.000.
Dreckmann, Karl, to M. Lehmacher & Sohn GmbH Maschinenfabrik. Stack conveyor for bag-making apparatus. 4,536,174, Cl. 493-194.000.
Drent, Eit, to Shell Oil Company. Process for the preparation of carboxylic anhydrides. 4,536,354, Cl. 260-549.000.
Dubowicz, Palemon W., to United States of America, Army. Coaxial power dissipation line. 4,536,768, Cl. 343-736.000.
Duder, Richard A.; and Corral, Allan B., to Dynamic Valves, Inc. Electrically controlled valves. 4,535,810, Cl. 137-596.170.
Dumas, Philip E.: *See*—
Stockel, Richard F.; and Dumas, Philip E., 4,536,571, Cl. 536-23.000.
Duncan, Richard K.; and Russell, Norton A., to Vernay Laboratories, Inc. Valve assembly. 4,535,818, Cl. 137-846.000.
Dunham-Bush, Inc.: *See*—
Orlando, Salvatore; and Martin, David R., 4,536,130, Cl. 417-63.000.
Dunham, Warren D., to Schonstedt Instrument Company. Magnetic detector instrument with board-mounted sensor assembly. 4,536,710, Cl. 324-244.000.
Du Pont de Nemours, E. I., and Company: *See*—
Carcia, Peter F., 4,536,482, Cl. 502-5.000.
Forsten, Herman H., 4,536,439, Cl. 428-280.000.
Fremont, Joseph M., 4,536,491, Cl. 502-174.000.
Hormadaly, Jacob, 4,536,329, Cl. 252-518.000.
Latham, Roger A., 4,536,541, Cl. 525-66.000.
Levitt, George, 4,536,576, Cl. 544-321.000.
Usala, Hugo R., 4,536,535, Cl. 524-403.000.
Vander-Mallie, Ronald, 4,536,479, Cl. 436-537.000.
Duval Corporation: *See*—
Ochs, Leonard R.; Fletcher, Archibald W.; Weber, Harald; and Naden, David, 4,536,214, Cl. 75-101.00R.
Duvdevani, Ilan: *See*—
Lundberg, Robert D.; Peiffer, Dennis G.; and Duvdevani, Ilan, 4,536,539, Cl. 524-521.000.
Duve, John P., to Singer Company, The. Expanded interval timer drive mechanism. 4,536,627, Cl. 200-38.00R.
Duwel, Edward C., to Pitney Bowes Inc. Monitoring the status of the trip cycle in an electronic postage meter. 4,536,850, Cl. 364-550.000.
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, to Feldmuhle Aktiengesellschaft. Piston with a member made of partially stabilized zirconium oxide. 4,535,683, Cl. 92-224.000.
Dynamic Valves, Inc.: *See*—
Duder, Richard A.; and Corral, Allan B., 4,535,810, Cl. 137-596.170.
Dynatech Frontier Corporation: *See*—
Troutman, Samuel J., Jr.; and Hixenbaugh, D. Wayne, 4,535,634, Cl. 73-747.000.
Dziark, John J., to General Electric Company. Scavengers for ammonia in RTV compositions. 4,536,540, Cl. 524-701.000.
Dzigan, Viktor P.: *See*—
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.
Dziuba, Peter: *See*—
Maurer, Dieter; Rauter, Jurgen; and Dziuba, Peter, 4,536,003, Cl. 280-95.00R.
E. R. Squibb & Sons, Inc.: *See*—
Das, Jagabandhu; and Haslanger, Martin F., 4,536,513, Cl. 514-469.000.
Das, Jagabandhu; and Haslanger, Martin F., 4,536,514, Cl. 514-469.000.
Sundeen, Joseph E.; Haugwitz, Rudiger D.; and Sprague, Peter W., 4,536,501, Cl. 514-225.000.
E-Systems, Inc.: *See*—
Livingston, William D.; and Jacob, Eugene E., 4,536,877, Cl. 370-94.000.
E-Z P.A.C., Inc.: *See*—
Sherman, Ralph A., II; and Watson, Calvin R., 4,535,929, Cl. 229-39.00R.
Eagle-Picher Industries, Inc.: *See*—
Markle, Richard A., 4,536,582, Cl. 548-477.000.
Eason, Lloyd R., to Dowley Manufacturing, Inc. Flaring tool. 4,535,616, Cl. 72-116.000.
Eastman Kodak Company: *See*—
Chandler, Jasper S.; and Geyer, Frederick F., 4,536,869, Cl. 369-287.000.
Klijanowicz, James E.; and Kovacs, Csaba A., 4,536,598, Cl. 564-49.000.
Eastwood, Barbara J.: *See*—
McCandliss, Russell J.; Eastwood, Barbara J.; and Milch, Robert A., 4,536,207, Cl. 71-88.000.
Easy Ride, Inc.: *See*—
Oldfield, Peter M., 4,535,495, Cl. 5-432.000.
Eaton Corporation: *See*—
Aschenbach, Louis F., 4,536,736, Cl. 337-317.000.
Theisen, Peter J.; and Chen, C. Gregory, 4,536,814, Cl. 361-7.000.
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,536,884, Cl. 378-119.000.
Ebben, Gerald J., to American Can Company. Process and apparatus using ultra-filtration in the production of can shells. 4,535,615, Cl. 72-39.000.
Eberle, John W., to Hawkeye Container Company. Method of containing, storing, and transporting agricultural products in a high moisture condition. 4,535,586, Cl. 53-432.000.
Ebert, Edward A., to Tayco Developments, Inc. Surgical bone tie. 4,535,764, Cl. 128-92.00B.
Ebihara, Shigeto; Ohta, Atsuo; and Kuwabara, Kunikazu, to Secom Co., Ltd. Car-directing apparatus for an alarm system. 4,536,750, Cl. 340-539.000.
Ebisawa, Mikio: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,536,352, Cl. 260-543.00F.

Eder, Herbert, to Knorr-Bremse GmbH. Service brake accelerator for indirect compressed-air brakes on railway vehicles. 4,536,040, Cl. 303-37.000.

EerNisse, Errol P.; and Ward, Roger W., to Quartztronics, Inc. Resonator transducer system with temperature compensation. 4,535,638, Cl. 73-862.590.

Egawa, Takeshi: *See*—
Taniguchi, Nobuyuki; Ishikawa, Norio; and Egawa, Takeshi, 4,536,072, Cl. 354-403.000.

Egawa, Yoshinori, to Yamaichi Electric Mfg. Co., Ltd. IC Package carrier. 4,535,887, Cl. 206-328.000.

Egbers, Gerhard; and Weinsdorfer, Helmut, to Maschinenfabrik Rieter AG. Apparatus for the production of fixed point multifilament yarns. 4,535,516, Cl. 28-272.000.

Eguchi, Yoshinori: *See*—
Maruyama, Jisaburou; Fukayama, Sumio; Miyake, Masanobu; Watanabe, Yoshimi; and Eguchi, Yoshinori, 4,536,676, Cl. 313-318.000.

Eich, Otwin: *See*—
Post, Karl-Heinz; and Eich, Otwin, 4,535,966, Cl. 251-31.000.

Einsele, Gerhard: *See*—
Dettelbach, Alfred; Gresser, Gerhard; and Einsele, Gerhard, 4,535,965, Cl. 249-83.000.

El Paso Polyolefins Company: *See*—
Hattori, Kiyoshi; and Myers, John H., 4,536,549, Cl. 525-240.000.

Eldon Industries, Inc.: *See*—
Evenson, Mel, 4,535,896, Cl. 211-41.000.
Soulakis, George, 4,535,705, Cl. 108-152.000.

Electrochemische Energieconversie N.V.: *See*—
Blanchart, Alain P. O.; and Adriaensen, Ludovicus C. M., 4,536,272, Cl. 204-294.000.

Elf France: *See*—
Deschamps, Patrice P. M.; Gallo, Roger; and Grangette, Henri, 4,536,594, Cl. 562-400.000.

Elfen, Adolf: *See*—
Grimm, Rainer; and Elfen, Adolf, 4,536,829, Cl. 362-74.000.

Elger, Walter: *See*—
Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, 4,536,401, Cl. 514-173.000.

Elkins, Carol M. Decorative bathtub. 4,535,489, Cl. 4-546.000.

Ellingsworth, John R.: *See*—
Blackburn, Linda B.; and Ellingsworth, John R., 4,535,636, Cl. 73-831.000.

Elliott, Robert D.: *See*—
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., 4,536,575, Cl. 544-279.000.

Elmer, Werner: *See*—
Huse, Horst; and Elmer, Werner, 4,536,738, Cl. 340-146.200.

Elxsi: *See*—
Olson, Robert A.; and Ross, Patrick D., 4,536,837, Cl. 364-200.000.

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Mertz, Denny W., 4,535,805, Cl. 137-489.000.

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Shedigian, Vandos, 4,536,331, Cl. 252-579.000.
Willitts, Benjamin R.; and Klossman, Charles W., 4,535,603, Cl. 62-196.400.

EMPI, Inc.: *See*—
Ober, Stephen H., 4,535,779, Cl. 128-644.000.

Endo, Tomio: *See*—
Kamei, Masayuki; Endo, Tomio; and Hashimoto, Yutaka, 4,536,298, Cl. 252-8.050.

Endoh, Eiji: *See*—
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, 4,536,259, Cl. 204-35.100.

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Takayama, Toshio; Ando, Hiromi; and Endou, Mitsuhiro, 4,535,680, Cl. 91-376.00R.

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Smith, Roderick L., 4,535,571, Cl. 51-165.870.
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Engel, Wolfhard; Bauer, Eckhart; Trummlitz, Gunter; Danneberg, Peter; and Kahling, Joachim, to Dr. Karl Thomae Gesellschaft mit beschranter Haftung. Vinylogous carboxamides. 4,536,402, Cl. 514-443.000.

Engelmann, Eberhard: *See*—
Schmeer, Gert; Engelmann, Eberhard; and Schafer, Karl, 4,536,441, Cl. 428-317.300.

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Rinehart, James W.; Gilleland, Frank W.; and Engen, Byron W., 4,535,756, Cl. 126-450.000.

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English, George; and Leadvaro, Stephen J., to GTE Products Corporation. Replacement lamp with means for spacing. 4,536,831, Cl. 362-263.000.

Erickson, Chad S., to Alternative Pioneering Systems Inc. Food dehydrator. 4,536,643, Cl. 219-400.000.

Erickson, John W., to Boltswitch, Inc. Pull out fusible switches. 4,536,046, Cl. 339-31.00M.

Erickson, Lloyd A., to Illinois Tool Works Inc. Gasket fastener arrangement. 4,535,565, Cl. 49-493.000.

Erickson, Mark R.; and Kaehler, James A., to Atlantic Richfield Company. Heliostat control employing direct current motor. 4,536,847, Cl. 364-516.000.

Ericson, Kurt S. B. Automatic air valve device for ducts. 4,535,807, Cl. 137-533.310.

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Waechter, David A.; Erkkila, Bruce H.; and Vasilik, Dennis G., 4,536,841, Cl. 364-414.000.

Eskamani, Abolghassem; and Krause, Warren H., to Standard Oil Company (Ohio), The. Process for the thermochemical conversion of biomass. 4,536,584, Cl. 549-429.000.

Esper, Friedrich J.; and Gohl, Walter, to Robert Bosch GmbH. Endoprosthesis shaft. 4,535,487, Cl. 623-22.000.

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Mesnel, Francois, 4,535,563, Cl. 49-478.000.

Ethyl Corporation: *See*—
Mueller, Warren B., 4,536,520, Cl. 521-89.000.
Ramachandran, Venkataraman, 4,536,343, Cl. 260-465.00F.
Seemuth, Paul D., 4,536,190, Cl. 44-57.000.

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Chauviere, Henri, 4,536,100, Cl. 403-12.000.

Evans, William P., to Union Carbide Corporation. Tellurium-containing cathodes for nonaqueous cells. 4,536,456, Cl. 429-194.000.

Evenson, Mel, to Eldon Industries, Inc. Folding, extensible holder. 4,535,896, Cl. 211-41.000.

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Ex-Cell-O Corporation: *See*—
Sandy, Julius W.; Riebock, William D.; and Bauscher, Billy J., 4,536,107, Cl. 408-214.000.

Exxon Research and Engineering Co.: *See*—
Agarwal, Pawan K.; Lundberg, Robert D.; Graessley, William W.; and Ver Strate, Gay, 4,536,310, Cl. 252-33.000.
Davis, Thomas A., 4,536,283, Cl. 208-309.000.
Lundberg, Robert D.; Peiffer, Dennis G.; and Duvdevani, Ilan, 4,536,539, Cl. 524-521.000.
Lundberg, Robert D.; and Phillips, Robert R., 4,536,547, Cl. 525-186.000.
Pirkle, James C., Jr.; Montagna, Angelo A.; and Ruziska, Philip A., 4,536,380, Cl. 423-359.000.
Sheng, Ping; and Bloch, Aaron N., 4,536,608, Cl. 136-259.000.

Eylon, Daniel; and Froes, Francis H., to United States of America, Air Force. Method for refining microstructures of blended elemental powder metallurgy titanium articles. 4,536,234, Cl. 148-133.000.

Fabrizio, Louis F.; Lin, Samuel O. S.; and Jacobine, Anthony F., to Loctite Corporation. Siloxane polyphotoinitiators of the substituted acetophenone type. 4,536,265, Cl. 204-159.130.

Fagan, Joseph H.; and Pristo, Paul J. Graded actuation of hydraulically actuated pool cleaning heads. 4,535,937, Cl. 239-206.000.

Fairchild Camera and Instrument Corporation: *See*—
Lyon, Richard F., 4,536,844, Cl. 364-487.000.

Faith, Thomas J., Jr., to RCA Corporation. Method of lowering contact resistance of implanted contact regions. 4,536,223, Cl. 148-1.500.

Falconer, David G. Pivot bearing. 4,536,042, Cl. 308-2.00A.

Falk, Richard A. Ceramic fiber molten metal sampler. 4,535,640, Cl. 73-864.550.

Falk, Robert A.; and Borsodi, Istvan, to Ciba-Geigy Corporation. Ammonium and amine salts of di-perfluoroalkyl group containing acids and compositions and use thereof. 4,536,254, Cl. 162-135.000.

Fanuc Ltd.: *See*—
Kozai, Yoshinori; Amemiya, Yoichi; and Asahara, Sunao, 4,536,649, Cl. 250-231.0SE.

Farah, Robert L., to AT&T Bell Laboratories. Digital quantizer. 4,536,741, Cl. 340-347.0DD.

Farnsworth, Robert P.: *See*—
Adams, C. Harris; and Farnsworth, Robert P., 4,536,646, Cl. 235-377.000.

Farrell, Christopher J.; and Tsai, Boh C., to American Can Company. Oxygen scavenger. 4,536,409, Cl. 426-398.000.

Farrell, W. James; and Diehl, Werner K., to Illinois Tool Works Inc. Self centering quick-change cutting tool assembly. 4,536,110, Cl. 409-11.000.

Farris, Eugene A. Socket wrench having automatic nut-ejecting capability. 4,535,657, Cl. 81-124.100.

Fattal, Jean A.; and Roesler, Michael L., to Raytheon Company. Control for gimballed monopulse antenna arrangement. 4,536,685, Cl. 318-254.000.

Fayard, Jean F.: *See*—
Riou, Claude R.; and Fayard, Jean F., 4,536,219, Cl. 106-21.000.

Faylor, Lawrence E., to Deere & Company. Vehicle cooling system utilizing one radiator. 4,535,729, Cl. 123-41.100.

Fazis, Harald, to Ludwig Boschert GmbH & Co., KG. Notching machine. 4,535,665, Cl. 83-556.000.

Fechant, Louis: *See*—
Belbel, Elie; Blanchard, Christian; Fechant, Louis; Haury, Andre; and Lauraire, Michel, 4,536,630, Cl. 200-151.000.

Feder, Meinrad; and Stegmaier, Alwain, to Robert Bosch GmbH. Pressure controller. 4,535,816, Cl. 137-625.650.

Federal-Mogul Corporation: *See*—
Saxton, Robert W.; Hewitt, William R.; and Nelligan, Jerome M., 4,536,108, Cl. 408-230.000.

Feecon Corporation: *See*—
Gagliardo, John P.; Morse, Donald K.; and Pruneau, Albert, Jr., 4,535,846, Cl. 169-25.000.

Fekete, Ferenc; and Spears, James E., to Mattel, Inc. Quick release spring powered toy vehicle. 4,536,169, Cl. 446-461.000.

Feldle, Gunter; and Fischer, Klaus, to Klein, Schanzlin & Becker Aktiengesellschaft. Barrel housing for centrifugal fluid machines. 4,536,128, Cl. 415-219.00C.
Feldmuhle Aktiengesellschaft: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,535,683, Cl. 92-224.000.
Feller, Murray F., to Wilgood Corporation. Flow detection apparatus. 4,535,637, Cl. 73-861.770.
Fellmann, Jere D.; Garrou, Philip E.; Withers, Howard P., Jr.; and Seyferth, Dietmar, to Dow Chemical Company, The. Polymers of ferrocene. 4,536,589, Cl. 556-14.000.
Felt Products Mfg. Co.: *See*—
Cardis, James C.; and Inciong, Josefino T., 4,535,996, Cl. 277-1.000.
Locacius, Robert F., 4,535,999, Cl. 277-235.00B.
Fencsik, Gabor: *See*—
Ringel, Gerhard; and Fencsik, Gabor, 4,536,838, Cl. 364-200.000.
Fennesz, Frank, Jr.: *See*—
Szostak, Jan; and Fennesz, Frank, Jr., 4,535,710, Cl. 112-459.000.
Fernsler, Ronald E.; and Vinekar, Sanjay R., to RCA Corporation. Television receiver having different receiver synchronizing characteristics in response to television signal. 4,536,794, Cl. 358-158.000.
Ferraro, Frank A.; and Byrne, David S., to Warner-Lambert Company. Disposable plastic razor. 4,535,537, Cl. 30-32.000.
Fester, Walter; and Huber, Bernd, to Hoechst Aktiengesellschaft. Process for production of set polyacrylonitrile filaments and fibers. 4,536,363, Cl. 264-182.000.
Fey, Robert M.; Woehler, Harold L.; and Manthei, Philip J., to Speed Queen Company. Apparatus and control for tilt-out washer. 4,535,610, Cl. 68-3.00R.
Fiedler, Paul; and Braden, Rudolf, to Bayer Aktiengesellschaft. Process for formylating aryl halides. 4,536,344, Cl. 260-465.00R.
Field, Joseph J.: *See*—
Allen, Richard M.; Arnold, Jeffrey M.; Field, Joseph J.; and Spraker, Terry E., 4,536,770, Cl. 346-29.000.
Fields, Ellis K.: *See*—
Winzenburg, Mark L.; Fields, Ellis K.; and Shneider, Benjamin L., 4,536,560, Cl. 528-188.000.
Filbert, Walter H.: *See*—
Rufer, Rosalyn J.; and Filbert, Walter H., 4,536,553, Cl. 525-106.000.
Findeisen, Kurt: *See*—
Kranz, Eckart; and Findeisen, Kurt, 4,536,353, Cl. 260-545.00R.
Fingerle, Dieter: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,535,683, Cl. 92-224.000.
Finn, Albert E.: *See*—
Ginns, Haskell; and Finn, Albert E., 4,535,624, Cl. 73-119.00R.
Finnigan Mat GmbH: *See*—
Cooks, Graham; Story, Michael S.; Jung, Gerhard; and Dobberstein, Peter, 4,536,652, Cl. 250-281.000.
Fiori, Robert; Seyfried, Philippe; and Symard, Jose , to Commissariat a l'Energie Atomique. Band saw. 4,535,666, Cl. 83-795.000.
Fischer, Klaus: *See*—
Feldle, Gunter; and Fischer, Klaus, 4,536,128, Cl. 415-219.00C.
Fischer, Peter; and Schubert, Paul, to Alfing Kessler Sondermaschinen GmbH. Tool exchanging device for a multi-spindle machine tool. 4,535,527, Cl. 29-568.000.
Fischer, Wolfgang; and Leiblein, Felix, to Bayer Aktiengesellschaft. Medicaments containing muzolimine, their use and processes for their production. 4,536,511, Cl. 514-404.000.
Fisher, Stanton E. Hair-containing rawhide toys. 4,535,725, Cl. 119-29.000.
Fitzgerald, Charles S.: *See*—
Berthold, John W., III; and Fitzgerald, Charles S., 4,536,827, Cl. 362-32.000.
Fitzsimons, James R.: *See*—
Cheal, James; and Fitzsimons, James R., 4,536,752, Cl. 340-554.000.
Flanders Filters, Inc.: *See*—
Wood, Joseph A.; and Peebles, William C., Jr., 4,535,811, Cl. 137-601.000.
Flannery, James E.; Stempin, John L.; and Wexell, Dale R., to Corning Glass Works. Opal glasses having an apatite opacifying phase. 4,536,480, Cl. 501-32.000.
Flannery, James E.; Stempin, John L.; and Wexell, Dale R., to Corning Glass Works. Opal glasses having an apatite opacifying phase. 4,536,481, Cl. 501-32.000.
Fledderjohann, Paul F.: *See*—
Barrett, Howard W.; and Fledderjohann, Paul F., 4,536,824, Cl. 361-384.000.
Fletcher, Archibald W.: *See*—
Ochs, Leonard R.; Fletcher, Archibald W.; Weber, Harald; and Naden, David, 4,536,214, Cl. 75-101.00R.
Flippance, Christopher F.: *See*—
Bick, David E.; Flippance, Christopher F.; and Parry, Ian C., 4,535,872, Cl. 188-62.000.
Flow Industries, Inc.: *See*—
Olsen, John H.; and Mordre, Sigurd C., 4,536,135, Cl. 417-383.000.
Floyd, Middleton B., Jr.; and Goidl, Jo A., to American Cyanamid Company. Method of treating diabetes mellitus using arylglyoxals. 4,536,517, Cl. 514-576.000.
Fluckiger & Huguenin S.A.: *See*—
Cattin, Francois, 4,536,156, Cl. 433-102.000.
Fluor Corporation: *See*—
Daniell, Alan F., 4,535,900, Cl. 212-193.000.
Flynn, Robert G.; Pitkin, Courtney G.; and Hileman, Gregory A., to Norcliff Thayer, Inc. Use of fumed silica for treating oily skin and acne. 4,536,399, Cl. 514-63.000.
FMC Corporation: *See*—
Plummer, Ernest L., 4,536,591, Cl. 560-8.000.
Shimp, Lawrence A., 4,536,377, Cl. 423-315.000.
Foa, Marco: *See*—
Gardano, Andrea; Francalcanci, Franco; and Foa, Marco, 4,536,595, Cl. 562-406.000.
Fogle, Richard M.: *See*—
Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., 4,536,791, Cl. 358-122.000.
Fohl, Michael W.: *See*—
Sawyer, Robert D.; and Fohl, Michael W., 4,536,145, Cl. 425-289.000.
Foley, Norman G. Football goal post with explosive-type souvenir projector. 4,535,988, Cl. 273-55.00D.
Fontaine, Paul. Blast nozzle for blowing off liquids from surfaces. 4,535,936, Cl. 239-117.000.
Foolish Fantasies B.V.: *See*—
Kuiper, Johnny, 4,535,933, Cl. 237-12.30A.
Ford Aerospace & Communications Corporation: *See*—
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,535,961, Cl. 248-183.000.
Ford Motor Company: *See*—
Kordomenos, Panagiotis I., 4,536,558, Cl. 528-100.000.
Logothetis, Eleftherios M.; and Kaiser, William J., 4,536,241, Cl. 156-89.000.
Ma, Thomas T., 4,535,738, Cl. 123-425.000.
Ma, Thomas T., 4,535,740, Cl. 123-435.000.
Nielsen, Arnold D., 4,536,818, Cl. 361-154.000.
Formulabs Industrial Inks, Inc.: *See*—
Ryan, Thomas D., 4,536,184, Cl. 8-508.000.
Forrester, Harry L.: *See*—
Johanson, Leonard T.; and Forrester, Harry L., 4,535,808, Cl. 137-543.000.
Forsten, Herman H., to Du Pont de Nemours, E. I., and Company. Light weight filter felt. 4,536,439, Cl. 428-280.000.
Forster, Alfred, to Siemens Aktiengesellschaft. Piezoelectric ultrasonic converter with polyurethane foam damper. 4,536,673, Cl. 310-327.000.
Forster-Willi Corporation: *See*—
Ochsner, Arnold, deceased, 4,535,617, Cl. 72-307.000.
Foster Wheeler Energy Corporation: *See*—
Neale, Thomas J., 4,535,801, Cl. 137-240.000.
Stewart, Robert D.; and Gamble, Robert L., 4,536,121, Cl. 414-219.000.
Fox, Karl M.: *See*—
Burgess, Lester E.; Fox, Karl M.; McGarry, Phillip E.; and Herman, David E., 4,536,372, Cl. 422-187.000.
Foyer d'Aciernergie Inc.: *See*—
Bourgeois, Jean-Louis, 4,535,751, Cl. 126-121.000.
Frade, Americo G. P.: *See*—
Davis, Curry B.; and Frade, Americo G. P., 4,536,332, Cl. 260-97.600.
Framatome: *See*—
Leclercq, Joseph, 4,535,523, Cl. 29-402.080.
Francalcanci, Franco: *See*—
Gardano, Andrea; Francalcanci, Franco; and Foa, Marco, 4,536,595, Cl. 562-406.000.
Franchi, Roberto D. Child proof medicine vial. 4,535,903, Cl. 215-213.000.
Franci, Vittorio: *See*—
Carobbi, Renato; Miletti, Sandro; and Franci, Vittorio, 4,536,221, Cl. 127-30.000.
Frangatos, Gerassimos, to Mobil Oil Corporation. Sulfurized amine condensation products and lubricant compositions containing same. 4,536,312, Cl. 252-47.500.
Franz Kirsten Electrotechnische Spezialfabrik: *See*—
Grimm, Rainer; and Elfen, Adolf, 4,536,829, Cl. 362-74.000.
Frazita, Richard F., to Hazeltine Corporation. Scanning antenna with automatic beam stabilization. 4,536,766, Cl. 343-372.000.
Frederick, Edward C.: *See*—
Derderian, Thomas; Frederick, Edward C.; and Gross, Alexander L., 4,535,553, Cl. 36-28.000.
Free Motion Designs Corporation: *See*—
De-La-Concha-Caceres, Alfonso, 4,535,983, Cl. 272-6.000.
Freeman, Robert D., to Westinghouse Electric Corp. Method of counting multiple targets in the post detection processing of a radar. 4,536,764, Cl. 343-5.0SA.
Freeman, William T.: *See*—
d'Entremont, Alice M.; and Freeman, William T., 4,536,848, Cl. 364-526.000.
Freese, Karl-Heinz; and Munch, Hans-Jurgen, to Akzo N.V. Aqueous coating composition based on a cationic amino urea resin, process for applying and baking the composition and the coated substrate thus obtained. 4,536,525, Cl. 523-414.000.
Fremont, Joseph M., to Du Pont de Nemours, E. I., and Company. Agglomerates of malachite crystals and method for their preparation. 4,536,491, Cl. 502-174.000.
Frenchy, James H.: *See*—
Lala, Louis A.; and Frenchy, James H., 4,535,549, Cl. 34-4.000.
Friedl, Andreas. Hot bulb ignition head for a device for firing rough ceramics, particularly bricks. 4,535,708, Cl. 110-265.000.

Friedman, Harry; Sengoku, Isao; Hattori, Yukiro; and Isikawa, Minoru, to Jet AER Corporation. Folding knife with safety locking feature. 4,535,539, Cl. 30-161.000.
Friedrich Grohe Armaturenfabrick GmbH & Co.: *See*—
Pawelzik, Manfred; Herring, William P.; and Kostorz, Jan R., 4,535,814, Cl. 137-625.170.
Fritsch, Joseph E.: *See*—
Stelzer, Jack C.; and Fritsch, Joseph E., 4,535,648, Cl. 74-544.000.
Fritz Eichenauer: *See*—
Macherle, Gunter; and Lieber, Ludwig, 4,535,916, Cl. 222-113.000.
Froes, Francis H.: *See*—
Eylon, Daniel; and Froes, Francis H., 4,536,234, Cl. 148-133.000.
Frost, John R.: *See*—
Vaccaro, Nancy J.; Frost, John R.; Glatz, Alfred C.; and Schenz, Timothy W., 4,536,410, Cl. 426-548.000.
Fry, Jewell C. Device for attaching a hooked item for catching fish or the like to a line with a knot therein. 4,535,562, Cl. 43-44.950.
Frye, Robert B.; and Zembayashi, Michio, to General Electric Company. Flame retardant thermoplastic compositions. 4,536,529, Cl. 524-284.000.
Fu, Horng-Sen: *See*—
Chen, Devereaux C.; and Fu, Horng-Sen, 4,535,528, Cl. 29-571.000.
Fugakawa, Yasuo: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,536,397, Cl. 514-11.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Kodama, Masayuki; and Kobayashi, Toshio, 4,535,650, Cl. 74-665.0GA.
Kudo, Ichiro; Kasai, Yoshiaki; and Yuasa, Masaharu, 4,535,739, Cl. 123-425.000.
Fuji Kogyo Co., Ltd.: *See*—
Ohmura, Ryuichi, 4,535,642, Cl. 74-58.000.
Fuji Photo Film Co., Ltd.: *See*—
Hara, Yoshio; and Sugimoto, Yukihiro, 4,536,067, Cl. 354-180.000.
Kato, Hirohiko; Ichijima, Seiji; Adachi, Keiichi; and Watanabe, Toshiyuki, 4,536,472, Cl. 430-505.000.
Masuda, Takanori; Kakei, Tsutomu; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,536,264, Cl. 204-129.430.
Mihara, Yuji, 4,536,473, Cl. 430-575.000.
Nagao, Makoto; and Nahara, Akira, 4,536,443, Cl. 428-336.000.
Nagashima, Akira; Hasegawa, Akira; Aoai, Toshiaki; and Nagano, Teruo, 4,536,464, Cl. 430-192.000.
Oishi, Kengo; and Suzuki, Osamu, 4,536,812, Cl. 360-133.000.
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,536,466, Cl. 430-203.000.
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,536,467, Cl. 430-203.000.
Fuji Xerox Co., Ltd.: *See*—
Inui, Toshiharu; and Moriguchi, Haruhiko, 4,536,774, Cl. 346-76.0PH.
Kume, Hiroshi; and Tan, Yoichi, 4,536,875, Cl. 370-85.000.
Kurata, Masami, 4,536,802, Cl. 358-287.000.
Fujibayashi, Kenji, to Olympus Optical Co., Ltd. Tape recorder device having an automatic shut-off circuit. 4,536,808, Cl. 360-74.200.
Fujii, Akira, to NEC Corporation. Bidirectional constant current driving circuit. 4,536,662, Cl. 307-270.000.
Fujiki, Toshiaki; and Kano, Hikaru, to Mitsuboshi Belting Ltd. Method of heat-insulating and water-proof construction utilizing a roll having a web portion and a flap portion. 4,535,581, Cl. 52-746.000.
Fujino, Kenji: *See*—
Iwaoka, Hideto; Fujino, Kenji; Sugiyama, Tadashi; and Matsuura, Hiroyuki, 4,536,712, Cl. 324-309.000.
Fujita, Akio: *See*—
Dan, Takuya; and Fujita, Akio, 4,535,976, Cl. 267-8.00R.
Fujita, Shinsaku: *See*—
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,536,466, Cl. 430-203.000.
Sakaguchi, Yukihiko; Aono, Toshiaki; and Fujita, Shinsaku, 4,536,467, Cl. 430-203.000.
Fujitsu Limited: *See*—
Toyoda, Kazuhiro; and Shimada, Haruo, 4,536,860, Cl. 365-190.000.
Ueno, Kouji, 4,536,858, Cl. 365-104.000.
Fujitsu Ten Limited: *See*—
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,535,864, Cl. 180-177.000.
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,535,865, Cl. 180-177.000.
Fujiwara, Masami; Fukuda, Hidenori; and Tanaka, Minako, to Lion Corporation. Nonionic surfactant type vesicle dispersion. 4,536,324, Cl. 252-311.000.
Fujiwara, Michiaki: *See*—
Nakahara, Teiji; Sakai, Shoji; Noda, Koshi; Fujiwara, Michiaki; and Kubota, Nobunori, 4,535,944, Cl. 242-35.50A.
Fukayama, Sumio: *See*—
Maruyama, Jisaburou; Fukayama, Sumio; Miyake, Masanobu; Watanabe, Yoshimi; and Eguchi, Yoshinori, 4,536,676, Cl. 313-318.000.
Fukuchi, Shigeki, to Metako Kigyo Co., Ltd. Brake apparatus for winding a roll-screen. 4,535,829, Cl. 160-291.000.
Fukuda, Hidenori: *See*—
Fujiwara, Masami; Fukuda, Hidenori; and Tanaka, Minako, 4,536,324, Cl. 252-311.000.
Fukuda, Manabu. Looped, elongate letterpieces printing plate for use on rotary presses, and method of preparation. 4,535,694, Cl. 101-395.000.
Fukumoto, Fumio: *See*—
Watanabe, Yutaka; and Fukumoto, Fumio, 4,535,981, Cl. 271-121.000.
Fukuyasu, Harumi: *See*—
Ito, Tatsuo; Oba, Kazunori; Fukuyasu, Harumi; Niwa, Tomizo; Shomura, Takashi; and Kazuno, Yuzo, 4,536,398, Cl. 514-43.000.
Funabasama, Kouichi: *See*—
Hamatani, Fumikazu; and Funabasama, Kouichi, 4,536,619, Cl. 179-84.00R.
Funada, Fumiaki: *See*—
Takamatsu, Toshiaki; Funada, Fumiaki; Ishii, Yutaka; and Wada, Tomio, 4,536,060, Cl. 350-343.000.
Furukawa, Toshio, to Kikkoman Corporation. Classifier. 4,536,284, Cl. 209-305.000.
Furutsu, Akira, to Japan Bano'k Co., Ltd.; and Ben Clements & Sons, Inc. Fastener dispensing device. 4,535,926, Cl. 227-67.000.
Futakuchi, Takashi; Nakamura, Kiyofumi; Sato, Yoshimasa; Tsukuda, Toshio; and Shiraishi, Hiroyuki, to Sumitomo Metal Industries, Ltd.; and Sumitomo Heavy Industries Ltd. Waste gas circulation method and system for sintering apparatus. 4,536,211, Cl. 75-5.000.
G. D. Searle & Co.: *See*—
Collins, Paul W.; Gasiecki, Alan F.; and Weier, Richard M., 4,536,592, Cl. 560-53.000.
G.D. Societa per Azioni: *See*—
Belvederi, Bruno, 4,535,693, Cl. 101-366.000.
Gabriel, Edwin Z. Techniques for safely unloading cargo. 4,536,024, Cl. 294-82.240.
Gagliardo, John P.; Morse, Donald K.; and Pruneau, Albert, Jr., to Feecon Corporation. Fire fighting turret. 4,535,846, Cl. 169-25.000.
Gallas, Gunter A., to Slater Electric Inc. Clamp bushing for securing an electrical cable to an electrical outlet box. 4,536,613, Cl. 174-65.00R.
Gallo, Roger: *See*—
Deschamps, Patrice P. M.; Gallo, Roger; and Grangette, Henri, 4,536,594, Cl. 562-400.000.
Gamble, Robert L.: *See*—
Stewart, Robert D.; and Gamble, Robert L., 4,536,121, Cl. 414-219.000.
Gambro Lundia AB: *See*—
Brorsson, Fritz L.; Dahlberg, Bengt A. G.; and Holmberg, Bengt M., 4,536,201, Cl. 55-189.000.
Claren, Jan S.; Jeppsson, Jan-Bertil; and Staehr, Peter R., 4,535,635, Cl. 73-756.000.
Ganho, Eli A. Process and compositions for lithographic printing in multiple layers. 4,536,218, Cl. 106-290.000.
Gano, John C.; and Kohn, Gary A., to Otis Engineering Corporation. Valve. 4,535,968, Cl. 251-58.000.
GAO Gesellschaft fur Automation und Organisation: *See*—
Haghiri-Therani, Yaya; and Gauch, Wolfgang, 4,536,013, Cl. 283-77.000.
Gard, Eric A.; Kautter, William J., Jr.; and Bartsch, Kenneth E., to Pennsylvania Scale Company. Calibration method and apparatus for an electronic weight indicator. 4,535,854, Cl. 177-1.000.
Gardano, Andrea; Francalcanci, Franco; and Foa, Marco, to Montedison S.p.A. Process for the preparation of alpha-aryl-propionic acids and alkaline salts thereof. 4,536,595, Cl. 562-406.000.
Gardos, Ivan, to Biomatics Inc. Cap removal device for a cellular sample treatment apparatus. 4,535,585, Cl. 53-247.000.
Gargrave, Robert J. Rotary bending, particularly for press brakes. 4,535,619, Cl. 72-481.000.
Garito, Anthony F., to University Patents, Inc. Nonlinear optical materials and processes employing diacetylenes. 4,536,450, Cl. 428-411.100.
Garrou, Philip E.: *See*—
Fellmann, Jere D.; Garrou, Philip E.; Withers, Howard P., Jr.; and Seyferth, Dietmar, 4,536,589, Cl. 556-14.000.
Gartner, Joseph J. Electric motor fault and dynamic braking protection system. 4,536,686, Cl. 318-434.000.
Gartner, Karl, to Yoshida Kogyo K. K. Vertical mullion having heat transfer medium flow passage. 4,535,833, Cl. 165-53.000.
Garton, Robert E., Jr.; and Viglietti, John E., to American Orthodontics Corporation. Edgewise bracket. 4,536,154, Cl. 433-8.000.
Garvin, Stacy J.: *See*—
Cranford, Hayden C., Jr.; and Garvin, Stacy J., 4,536,720, Cl. 331-57.000.
Gasiecki, Alan F.: *See*—
Collins, Paul W.; Gasiecki, Alan F.; and Weier, Richard M., 4,536,592, Cl. 560-53.000.
Gaspar, Richard A., to Harris Graphics Corporation. Crimp blade holder. 4,536,176, Cl. 493-365.000.
Gateway Industries, Inc.: *See*—
Grabowski, Richard M., 4,535,514, Cl. 24-633.000.
Gauch, Wolfgang: *See*—
Haghiri-Therani, Yaya; and Gauch, Wolfgang, 4,536,013, Cl. 283-77.000.
Gault, Roger T., to Ingersoll Equipment Co., Inc. Control handle arrangement for power takeoff valve. 4,535,647, Cl. 74-543.000.
Gaur, Santosh P.: *See*—
Bhatia, Harsaran S.; Dorler, Jack A.; Gaur, Santosh P.; Lechaton, John S.; Mosley, Joseph M.; and Srinivasan, Gurumakonda R., 4,535,531, Cl. 29-577.00C.
Gayer, Melvin D.: *See*—
Burris, Lee R.; Speer, Billy L.; and Gayer, Melvin D., 4,536,172, Cl. 474-135.000.

Gealy, Elizabeth L. Animal handling and processing facility. 4,535,723, Cl. 119-20.000.
Gebruder Junghans GmbH: *See*—
Winterhalter, Walter, 4,535,695, Cl. 102-240.000.
Gelbard, Robert B., to General Electric Company. Temperature control for a cycle defrost refrigerator incorporating a roll-bonded evaporator. 4,535,600, Cl. 62-156.000.
Gell, Harold A. Data copy system. 4,536,081, Cl. 355-20.000.
Gem Industries, Inc.: *See*—
Guillot, Edmond P., 4,535,493, Cl. 5-100.000.
General Dynamics, Pomona Division: *See*—
Becnel, Larry H., 4,535,545, Cl. 33-550.000.
General Electric Company: *See*—
Allen, Richard B., 4,536,542, Cl. 525-67.000.
Bovenkerk, Harold P.; Gigl, Paul D.; and Corrigan, Francis R., 4,536,442, Cl. 428-323.000.
Brown, Dale M., 4,536,782, Cl. 357-23.100.
Brown, Edgar D., Jr., 4,536,590, Cl. 556-453.000.
DiMassimo, Donald V.; May, John B.; and Lemmon, Michael D., 4,536,759, Cl. 340-706.000.
Dziark, John J., 4,536,540, Cl. 524-701.000.
Frye, Robert B.; and Zembayashi, Michio, 4,536,529, Cl. 524-284.000.
Gelbard, Robert B., 4,535,600, Cl. 62-156.000.
Gur, David; Herron, John M.; and Pedersen, Robert H., 4,535,780, Cl. 128-659.000.
Jenkins, Thomas E., 4,535,524, Cl. 29-453.000.
Laskaris, Evangelos T., 4,535,596, Cl. 62-45.000.
Lindsay, Paul H., 4,535,870, Cl. 181-141.000.
Liu, Ping Y., 4,536,538, Cl. 524-508.000.
Miller, William H., 4,536,671, Cl. 310-258.000.
Rickert, Milton E., Jr., 4,536,420, Cl. 427-257.000.
Roberts, Victor D., 4,536,680, Cl. 315-49.000.
Rufer, Rosalyn J.; and Filbert, Walter H., 4,536,553, Cl. 525-106.000.
Sands, Robert W.; and Bloom, Daniel M., 4,536,834, Cl. 362-303.000.
General Foods Corporation: *See*—
Brander, Rita W.; Hammond, John E.; and Pasch, John H., 4,536,406, Cl. 426-104.000.
Vaccaro, Nancy J.; Frost, John R.; Glatz, Alfred C.; and Schenz, Timothy W., 4,536,410, Cl. 426-548.000.
General Motors Corporation: *See*—
Johnston, Ralph H.; Munden, Curtis D.; and Sheldrake, Leonard J., 4,536,697, Cl. 322-14.000.
Sacca, Demetrio B., 4,535,839, Cl. 165-153.000.
General Signal Corporation: *See*—
Binder, Paul B.; and Kroninger, Paul M., Jr., 4,536,820, Cl. 361-283.000.
Geng, Hans, to Plastik-Maschinenbau GmbH & Co., KG. Method of replastifying thermoplastic strips, foils or webs. 4,535,940, Cl. 241-3.000.
Georg Fischer Aktiengesellschaft: *See*—
Thalmann, Alfred, 4,536,644, Cl. 219-535.000.
George, Thomas R., Jr.; and Lochhead, Robert Y., Jr., to B. F. Goodrich Company, The. Stable mineral spirit dispersions of carboxyl-containing polymers. 4,536,528, Cl. 524-313.000.
Gerken, Carl F., to American Standard Inc. Seal-actuating mechanism for a wall panel. 4,535,578, Cl. 52-243.100.
Germanton, Charles: *See*—
Germanton, Damon; Germanton, Charles; and Weiss, Donald, 4,536,851, Cl. 364-557.000.
Germanton, Damon; Germanton, Charles; and Weiss, Donald. Electronic thermometer and associated apparatus. 4,536,851, Cl. 364-557.000.
Gervais, Alain; Vermeire, Daniel; Cerf, Olivier; and Toux, Jacques, to Institut National de la Recherche Agronomique. Process and apparatus for measuring rheological properties of semi-solid bodies by harmonic shear in rotation. 4,535,621, Cl. 73-59.000.
Gestetner, Jonathan; Green, Cyril; and Hanrahan, Thomas, to Gestetner Manufacturing Limited. Duplicating stencil. 4,535,690, Cl. 101-127.000.
Gestetner Manufacturing Limited: *See*—
Gestetner, Jonathan; Green, Cyril; and Hanrahan, Thomas, 4,535,690, Cl. 101-127.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Weirich, Walter; and Peters, Bernd, 4,536,017, Cl. 285-26.000.
Geyer, Frederick F.: *See*—
Chandler, Jasper S.; and Geyer, Frederick F., 4,536,869, Cl. 369-287.000.
Gianolini, Giovanni: *See*—
Knirsch, Franco; Gianolini, Giovanni; Dagna, Gian D.; and Buat, Mario, 4,536,776, Cl. 346-140.00R.
Gibbons, James F. One transistor dynamic random access memory. 4,536,785, Cl. 357-54.000.
Gibson, Duane M.; and Scott, Lewis A., to Omark Industries, Inc. Saw chain. 4,535,667, Cl. 83-830.000.
Giddings, Gary M., to Discovision Associates. Method and apparatus for recovering information from a videodisc. 4,536,863, Cl. 369-43.000.
Giga-Tronics, Inc.: *See*—
Kaye, Lawrence A.; and Mayer, Robert, 4,536,722, Cl. 331-117.00D.
Gigl, Paul D.: *See*—
Bovenkerk, Harold P.; Gigl, Paul D.; and Corrigan, Francis R., 4,536,442, Cl. 428-323.000.
Gilberto, Paul. Material hardness testing apparatus. 4,535,623, Cl. 73-81.000.
Gilcher, Heinz, to American Standard Inc. Vital solid state relay for railroad alternating current track circuits. 4,535,959, Cl. 246-34.00R.
Giles, Alan R.; and Mann, Kenneth G., to Queen's University at Kingston. Method for controlling hemophilia in mammals. 4,536,392, Cl. 424-101.000.
Gili, Paul E.: *See*—
Lang, Stephen C.; and Gili, Paul E., 4,536,723, Cl. 331-127.000.
Gillard, John W.: *See*—
Belanger, Patrice C.; and Gillard, John W., 4,536,515, Cl. 514-532.000.
Gilleland, Frank W.: *See*—
Rinehart, James W.; Gilleland, Frank W.; and Eagen, Byron W., 4,535,756, Cl. 126-450.000.
Gillen, Mark. Dispenser. 4,535,948, Cl. 242-55.200.
Gillette Company, The: *See*—
Kiricopeles, Charles P.; Behrens, Henry; and Brown, Robert L., 4,536,099, Cl. 401-209.000.
Ginns, Haskell; and Finn, Albert E., to Indikon Company, Inc., The. Engine monitoring system. 4,535,624, Cl. 73-119.00R.
Ginzburg, Vladimir E.: *See*—
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.
Giordano, Joseph F. Partially secure latch and lock device. 4,536,022, Cl. 292-228.000.
Giraudon, Raymond; and Santini, Georges, to Rhone-Poulenc Agrochimie. Fungicidal 2-cyanobenzimidazole derivatives, compositions, and method of use. 4,536,502, Cl. 514-227.000.
Girolamo, Mario: *See*—
Solomon, David H.; Ross, John B.; Girolamo, Mario; and Brett, Robert A., 4,536,016, Cl. 283-111.000.
Giussani, Alberto, to Societa' Cavi Pirelli, S.p.A. Oil-filled, multi-core cable with at least one conductor differing from others. 4,536,610, Cl. 174-26.00R.
Glatz, Alfred C.: *See*—
Vaccaro, Nancy J.; Frost, John R.; Glatz, Alfred C.; and Schenz, Timothy W., 4,536,410, Cl. 426-548.000.
Glaverbel: *See*—
Laurent, Michel, 4,536,424, Cl. 428-34.000.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,536,204, Cl. 65-60.400.
Glaxo Group Limited: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; Mackinnon, John W. M.; Judd, Duncan B.; and Hayes, Roger, 4,536,508, Cl. 514-383.000.
Glazener, Carey A., to Platt Saco Lowell Corporation. Method and means for providing assemblages of opened fibers for intimate blends. 4,535,512, Cl. 19-229.000.
Global Upholstery Company Limited: *See*—
Tenser, Adrian; Prizlow, Alfred J.; and Peters, Gerald I., 4,535,577, Cl. 52-221.000.
Go, Hiroyouki: *See*—
Okitsu, Kiyoshi; and Go, Hiroyouki, 4,536,563, Cl. 528-279.000.
Gobeli, Garth W., to Mercado Venture, The. Transducer for converting three dimensional mechanical input displacements into a corresponding electrical output signal. 4,536,746, Cl. 340-365.00A.
Gocho, Nagahiro: *See*—
Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, 4,536,369, Cl. 422-65.000.
Godfroid, Henri, to CGEE Alsthom. Circuit for energizing and controlling a synchronous rotary machine operating at variable speed. 4,536,692, Cl. 318-723.000.
Goetze, Richard: *See*—
Singer, Robert; Goetze, Richard; Maier, Karl; and Kerbl, Maximilian, 4,536,534, Cl. 524-262.000.
Gohl, Walter: *See*—
Esper, Friedrich J.; and Gohl, Walter, 4,535,487, Cl. 623-22.000.
Goidl, Jo A.: *See*—
Floyd, Middleton B., Jr.; and Goidl, Jo A., 4,536,517, Cl. 514-576.000.
Goldrian, Gottfried: *See*—
Bahr, Dietrich J.; Burckardt, Karl-Heinz; Goldrian, Gottfried; Rudolph, Volker; and Spruth, Wilhelm G., 4,536,769, Cl. 346-1.100.
Goldsmith, Elmar L., to PPG Industries Canada, Ltd. Method for treating potash with anticaking agent. 4,536,418, Cl. 427-213.000.
Goldwasser, David J.: *See*—
Chen, Augustin T.; Goldwasser, David J.; and Onder, Kemal, 4,536,533, Cl. 524-161.000.
Goller, Ernst; and Walker, Fritz, to H. Stoll GmbH & Company. Yarn tension device for a flat knitting machine. 4,535,609, Cl. 66-146.000.
Gonthier, Bruno: *See*—
Lelu, Andre ; Gonthier, Bruno; Grignon, Jean; and Tauzia, Jean-Michel, 4,536,235, Cl. 149-19.400.
Gonzalez, Jorge E.: *See*—
Hernandez, Luis A.; and Gonzalez, Jorge E., 4,536,146, Cl. 425-297.000.
Goodyear Aerospace Corporation: *See*—
Barrett, Howard W.; and Fledderjohann, Paul F., 4,536,824, Cl. 361-384.000.

Bischoff, Andrea L.; and Chin, Robert W., 4,535,957, Cl. 244-103.00R.

Goodyear Tire & Rubber Company, The: *See—*
Brubaker, Ronald L.; Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; Boyle, Frederick P.; Parkinson, Truman D.; and Rine, James C., 4,535,941, Cl. 241-21.000.

Goslarer Farbenwerke Dr. Hans Heubach GmbH & Co. KG: *See—*
Heubach, Rainer; Marx, Reinhard; Kunz, Peter; and Hauke, Dieter, 4,536,385, Cl. 423-621.000.

Goto, Akira: *See—*
Tsutsumikoshi, Shinobu; Goto, Akira; Murakami, Tsuyoshi; Takasaka, Masao; and Shinohara, Yoshiki, 4,535,869, Cl. 180-311.000.

Goto, Yasuyuki: *See—*
Sugimori, Shigeru; Kojima, Tetsuhiko; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,536,321, Cl. 252-299.630.

Gouilloud, Michel: *See—*
Sinha, Bikash K.; and Gouilloud, Michel, 4,535,631, Cl. 73-703.000.
Sinha, Bikash K.; and Gouilloud, Michel, 4,535,632, Cl. 73-703.000.

Gould, Inc.: *See—*
Baker, Richard H., 4,536,699, Cl. 323-276.000.

Goulter, Victor H., to Pressman, David, a part interest. Trash container attachments for supporting plastic bags. 4,535,911, Cl. 220-404.000.

Grabowski, Richard M., to Gateway Industries, Inc. Seat belt with plastic cover. 4,535,514, Cl. 24-633.000.

Graessley, William W.: *See—*
Agarwal, Pawan K.; Lundberg, Robert D.; Graessley, William W.; and Ver Strate, Gay, 4,536,310, Cl. 252-33.000.

Graf, Felix: *See—*
Baertschi, Peter; Wetter, Kurt; and Graf, Felix, 4,535,515, Cl. 28-245.000.

Grahl, Norma S. Pillow-tote bag device. 4,535,878, Cl. 190-1.000.

Grain Processing Corporation: *See—*
Morehouse, Alpha L.; and Lewis, Charles J., 4,536,408, Cl. 426-250.000.

Graindorge, Philippe; and Arditty, Herve , to Thomson-CSF. Optical fibre hydrophone. 4,536,861, Cl. 367-149.000.

Grallert, Hans-Joachim, to Siemens Aktiengesellschaft. Digital DPCM-coder having a high processing speed. 4,536,880, Cl. 375-30.000.

Gram, Klaus, to Brodrene Gram A/S. Apparatus for extraction of articles frozen in moulds in a freezing machine. 4,535,605, Cl. 62-345.000.

Grammas, James J.; Moskal, Walter J.; and Witt, Craig J., to GTE Automatic Electric Incorporated. Cable connector seating tool. 4,535,533, Cl. 29-749.000.

Grand, Paul S.: *See—*
Ramachandran, Pallassanna; and Grand, Paul S., 4,536,315, Cl. 252-174.110.

Grangette, Henri: *See—*
Deschamps, Patrice P. M.; Gallo, Roger; and Grangette, Henri, 4,536,594, Cl. 562-400.000.

Graphite Sales, Inc.: *See—*
Carlson, Walter H.; Zander, Gerald B.; Hanna, George C.; and Burmeister, Kevin L., 4,536,379, Cl. 423-345.000.

Grass, Alfred. Method of fabricating a base plate for a metal fitting, and stamping utilized in forming the base plate. 4,535,502, Cl. 16-382.000.

Grass Valley Group, Inc., The: *See—*
Dayton, Birney D., 4,536,665, Cl. 307-475.000.

Gray, David A.; and Webb, Donald O., to American Standard Inc. Heat exchange coil and method of making. 4,535,838, Cl. 165-134.00R.

Gray, Steven G.: *See—*
Morgan, Michael J.; and Gray, Steven G., 4,535,540, Cl. 30-358.000.

Greci, John J.; and Hoopengardner, Merle C., to Orcon Corporation. Methods and apparatus for locking the facing edges of carpet backings directly together at the seam during a face seaming operation with a hot melt adhesive tape. 4,536,244, Cl. 156-304.400.

Greco, Claudio; and Blandino, Silvano, to Societa' Impianti Elettrici Telefonici Telegrafici E Costruzioni Edili. Diaphragm pump. 4,536,139, Cl. 417-471.000.

Green, Cyril: *See—*
Gestetner, Jonathan; Green, Cyril; and Hanrahan, Thomas, 4,535,690, Cl. 101-127.000.

Green, Robert G.: *See—*
Boatright, Donald E., 4,536,177, Cl. 494-44.000.

Grell, Karl-Heinz; and Krappitz, Heinz, to B.A.T. Cigaretten-Fabriken GmbH. Pneumatic sealing apparatus. 4,535,885, Cl. 198-695.000.

Gresser, Gerhard: *See—*
Dettelbach, Alfred; and Gresser, Gerhard, 4,535,574, Cl. 51-204.000.
Dettelbach, Alfred; Gresser, Gerhard; and Einsele, Gerhard, 4,535,965, Cl. 249-83.000.

Gretag Aktiengesellschaft: *See—*
Luscher, Rene , 4,536,083, Cl. 355-40.000.

Grignon, Jean: *See—*
Leiu, Andre ; Gonthier, Bruno; Grignon, Jean; and Tauzia, Jean-Michel, 4,536,235, Cl. 149-19.400.

Grigsby, Robert A., Jr.; Speranza, George P.; Brennan, Michael E.; and Yeakey, Ernest L., to Texaco Inc. Manufacture of polyols and rigid polyurethane foam using thiodialkylene glycols. 4,536,522, Cl. 521-172.000.

Grimm, Gerold: *See—*
Kubach, Hans; Kemmner, Ulrich; and Grimm, Gerold, 4,536,731, Cl. 335-272.000.

Grimm, Rainer; and Elfen, Adolf, to Rockwell-Golde G.m.b.H.; and Franz Kirsten Electrotechnische Spezialfabrik. Hand actuating element for adjustment drives on automobiles. 4,536,829, Cl. 362-74.000.

Gripenholt, Ninneh; Berggren, Benny; and Boling, Goran, to Q & Q Retreading System AB. Method and apparatus for retreading vehicle tires. 4,536,242, Cl. 156-96.000.

Groeneveld, Michiel J.; Verver, Albert B.; and Van Swaaij, Willibrordus P. M., to James Howden & Company. Transfer apparatus. 4,535,551, Cl. 34-170.000.

Groff, Edwin T. Food processing apparatus. 4,536,147, Cl. 425-323.000.

Gross, Alexander L.: *See—*
Derderian, Thomas; Frederick, Edward C.; and Gross, Alexander L., 4,535,553, Cl. 36-28.000.

Gross, Daniel: *See—*
Prost, Jean-Louis; and Gross, Daniel, 4,535,627, Cl. 73-290.00B.

GTE Automatic Electric Incorporated: *See—*
Grammas, James J.; Moskal, Walter J.; and Witt, Craig J., 4,535,533, Cl. 29-749.000.

GTE Business Communication Systems Inc.: *See—*
Wagoner, John G.; and Smith, Louis W., 4,536,620, Cl. 179-90.00D.

GTE Communication Systems Corporation: *See—*
Skidanenko, Constantine V.; and McGibbon, Gregor D., 4,536,614, Cl. 179-18.0FA.

GTE Communications Products Corporation: *See—*
Blackburn, Tom L., 4,536,871, Cl. 370-74.000.

GTE Products Corporation: *See—*
Bouchard, Andre C.; Maya, Jakob; and Sentementes, Thomas, 4,536,678, Cl. 313-493.000.
Coad, Brian C., 4,536,215, Cl. 75-129.000.
English, George; and Leadvaro, Stephen J., 4,536,831, Cl. 362-263.000.

Guillemet, Bernard: *See—*
Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, 4,536,679, Cl. 313-541.000.

Guillet, James E.; Heskins, Michael; and Murray, D. Gary. Polymeric flocculants. 4,536,294, Cl. 210-730.000.

Guillot, Edmond P., to Gem Industries, Inc. Crib drop side latch. 4,535,493, Cl. 5-100.000.

Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, to U.S. Philips Corporation. Photocathode. 4,536,679, Cl. 313-541.000.

Gulf Canada Limited: *See—*
McCorriston, Lois L., 4,536,374, Cl. 423-68.000.

Gur, David; Herron, John M.; and Pedersen, Robert H., to General Electric Company. Apparatus for measuring xenon concentration in xenon cerebral blood-flow studies. 4,535,780, Cl. 128-659.000.

Guthrie, Roger T., to M&T Chemicals Inc. Pump apparatus and system for containing and metering uniform pulses of a small amount of a hazardous liquid. 4,536,140, Cl. 417-500.000.

Gyllstrom, Gregory W.: *See—*
Downing, Gerald T.; and Gyllstrom, Gregory W., 4,535,960, Cl. 248-74.500.

H. B. Fuller Company: *See—*
Hume, Robert M., III, 4,536,012, Cl. 281-21.00R.

H. Stoll GmbH & Company: *See—*
Goller, Ernst; and Walker, Fritz, 4,535,609, Cl. 66-146.000.

Haas, Lawrence W., to Hercules Incorporated. Selecting hydroxy-terminated polybutadiene for high strain propellants. 4,536,236, Cl. 149-19.920.

Haase, Thomas A.: *See—*
Pesa, Frederick A.; and Haase, Thomas A., 4,536,597, Cl. 562-522.000.

Haase, William H.: *See—*
Murdick, Brian K.; and Haase, William H., 4,535,891, Cl. 206-564.000.

Haasl, Robert J., to PDI, Inc. Flexible coating composition and method of applying same. 4,536,454, Cl. 428-516.000.

Hackney, John. Sail batten improvements. 4,535,825, Cl. 114-103.000.

Haddad, Heskel M. Anterior-posterior chamber intraocular lens. 4,535,488, Cl. 623-6.000.

Hafner, Ulrich, to International Standard Electric Corporation. Deflection unit for picture tubes. 4,536,730, Cl. 335-213.000.

Haghiri-Therani, Yaya; and Gauch, Wolfgang, to GAO Gesellschaft fur Automation und Organisation. Multilayered indentification card. 4,536,013, Cl. 283-77.000.

Hahn, Rainer, to Dragerwerk Aktiengesellschaft. Chemical oxygen generator. 4,536,370, Cl. 422-120.000.

Haines, Paul G., to Pennwalt Corporation. Catalyst for the preparation of methyl mercaptan from carbon oxides. 4,536,492, Cl. 502-216.000.

Haldemann A.G.: *See—*
Haldemann, Gaston; and Wirz, Francois, 4,536,006, Cl. 280-613.000.

Haldemann, Gaston; and Wirz, Francois, to Haldemann A.G. Safety binding of a boot on a ski. 4,536,006, Cl. 280-613.000.

Haldor Topsoe A/S: *See—*
Topp-Jorgensen, Jorgen, 4,536,485, Cl. 502-62.000.

Hall, Michael F. Portable shooting bench. 4,535,559, Cl. 42-94.000.

Halliburton Company: *See—*
Borchardt, John K., 4,536,303, Cl. 252-8.55R.
Borchardt, John K., 4,536,304, Cl. 252-8.55R.
Borchardt, John K.; and Young, Bill M., 4,536,305, Cl. 252-8.55R.
Loftin, Royal E.; and Son, Adelina J., 4,536,297, Cl. 252-8.50C.

Hama, Yoshihisa: *See—*
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Hamabe, Takafumi: *See*—
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Hamamoto, Tooru: *See*—
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Hamatani, Fumikazu; and Funabasama, Kouichi, to Nitsuko Limited. Ringing signal detection circuit. 4,536,619, Cl. 179-84.00R.
Hambrecht, Juergen; Reffert, Rudi W.; Minges, Peter; and Swoboda, Johann, to BASF Aktiengesellschaft. Removal of the catalyst from polyphenylene ethers. 4,536,567, Cl. 528-486.000.
Hammann, Ingeborg: *See*—
Sirrenberg, Wilhelm; Marhold, Albrecht; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, 4,536,587, Cl. 549-366.000.
Hammond, John E.: *See*—
Brander, Rita W.; Hammond, John E.; and Pasch, John H., 4,536,406, Cl. 426-104.000.
Hamster, Helmut; and Koppl, Franz, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe m.b.H. Device for treating gases at high temperatures. 4,536,642, Cl. 219-374.000.
Handi-Pac, Inc.: *See*—
Klawitter, Ronald R., 4,536,164, Cl. 446-143.000.
Handler, Michael: *See*—
Lichstein, Bernard; and Handler, Michael, 4,536,178, Cl. 604-15.000.
Hane, Toshioki: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,536,352, Cl. 260-543.00F.
Hanes, Ronnie M., to National Distillers and Chemical Corporation. Process for the preparation of alkyl nonadienoate esters. 4,536,340, Cl. 260-410.90R.
Hankey, Dana L., to Heraeus Cermalloy, Inc. Electrical resistance compositions and methods of making the same. 4,536,328, Cl. 252-518.000.
Hann, George W.: *See*—
O'Connor, Michael C.; and Hann, George W., 4,535,904, Cl. 215-215.000.
Hanna, George C.: *See*—
Carlson, Walter H.; Zander, Gerald B.; Hanna, George C.; and Burmeister, Kevin L., 4,536,379, Cl. 423-345.000.
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Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,536,299, Cl. 252-8.600.
Hanrahan, Gary V.: *See*—
Borisch, Donald J.; Hanrahan, Gary V.; and Merritt, Herbert E., 4,536,849, Cl. 364-550.000.
Hanrahan, Thomas: *See*—
Gestetner, Jonathan; Green, Cyril; and Hanrahan, Thomas, 4,535,690, Cl. 101-127.000.
Hansen, Bertil V.; Kelfve, Sten S.; and Mollberg, Henri R., to AB Carbogel. Compositions comprising coal, water and polyelectrolyte. 4,536,187, Cl. 44-51.000.
Haq, Zia, to Lever Brothers Company. Porous cross-linked absorbent polymeric materials. 4,536,521, Cl. 521-146.000.
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Okudaira, Tadashi; Tsuboi, Akio; Hama, Yoshihisa; and Hara, Mamoru, 4,535,901, Cl. 215-1.00C.
Hara, Takeo: *See*—
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Hara, Yoshio; and Sugimoto, Yukihiro, to Fuji Photo Film Co., Ltd. Film pack. 4,536,067, Cl. 354-180.000.
Harada, Tuneo: *See*—
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Harbert, Charles A.: *See*—
Welch, Willard M., Jr.; Harbert, Charles A.; Koe, B. Kenneth; and Kraska, Allen R., 4,536,518, Cl. 514-647.000.
Hardy, Frederick E.; Kitko, David J.; and Cambre, Cushman M., to Procter & Gamble Company, The. Bleach compositions comprising non-linear aliphatic peroxycarboxylic acid precursors. 4,536,314, Cl. 252-102.000.
Harlan, Wayne E., to RCA Corporation. Non-linear dynamic coring circuit for video signals. 4,536,796, Cl. 358-166.000.
Harper, Michael J. K.; Richardson, Dora N.; and Walpole, Arthur L., deceased, to Imperial Chemical Industries PLC. Alkene derivatives. 4,536,516, Cl. 514-514.000.
Harper, Robert J., Jr., to United States of America, Agriculture. Process to impart smooth-dry and flame retardant properties to cellulosic fabric. 4,536,422, Cl. 427-381.000.
Harrell, William C.: *See*—
Krumwiede, John F.; Harrell, William C.; Hilliard, William G.; and Harris, James E., 4,536,205, Cl. 65-135.000.
Harris Corporation: *See*—
Kasten, Alan J., 4,536,231, Cl. 148-33.100.
Miaskoff, Leonard, 4,536,119, Cl. 414-100.000.
Harris, Eugene G., to National Distillers and Chemical Corporation. Furan derivatives useful as aroma compounds. 4,536,349, Cl. 252-522.00R.
Harris Graphics Corporation: *See*—
Gaspar, Richard A., 4,536,176, Cl. 493-365.000.
Harris, James E.: *See*—
Krumwiede, John F.; Harrell, William C.; Hilliard, William G.; and Harris, James E., 4,536,205, Cl. 65-135.000.
Harris, Jesse R., to Phillips Petroleum Company. Coated diffusion membrane and its use. 4,536,196, Cl. 55-16.000.
Harris, Kenneth M.: *See*—
Kriz, Miroslav; and Harris, Kenneth M., 4,535,641, Cl. 74-53.000.
Harshbarger, John H., to Visual Information Institute, Inc. Method and apparatus for testing a CRT display under beam duty cycle variation. 4,536,792, Cl. 358-139.000.
Harshbarger, John H.; and Shores, William M., to Visual Information Institute, Inc. Pulse stretching circuit for a raster display. 4,536,793, Cl. 358-150.000.
Hart, Ronald L.; Work, Dale E.; and Davis, Colin E., to Capsulated Systems, Inc. Microencapsulated epoxy adhesive system. 4,536,524, Cl. 523-176.000.
Hartz, Peter: *See*—
Hertenstein, Ulrich; Mildenberger, Hilmar; Sachse, Burkhard; and Hartz, Peter, 4,536,509, Cl. 514-383.000.
Harvey Hubbell Incorporated: *See*—
Neuroth, David H., 4,536,609, Cl. 174-11.00R.
Hase, Christian: *See*—
Borggrefe, Gerhard; and Hase, Christian, 4,536,325, Cl. 252-314.000.
Hasegawa, Akira: *See*—
Nagashima, Akira; Hasegawa, Akira; Aoai, Toshiaki; and Nagano, Teruo, 4,536,464, Cl. 430-192.000.
Hasegawa, Makoto; Makimoto, Mitsuo; Yamashita, Sadahiko; and Katayama, Yoshio, to Matsushita Electric Industrial Company Limited. Voltage-controlled oscillator having three or more varactor diodes. 4,536,724, Cl. 331-177.00V.
Hasegawa, Shigekazu; Okita, Naoki; and Machida, Satoshi, to Kubota, Ltd. Tractor with three-point linkage connecting scraper thereto and automatic tilt control. 4,535,847, Cl. 172-2.000.
Hashimoto, Kiyoyasu; Yoshinaga, Kenji; Mori, Yoshio; Seino, Junzaburo; Kenmochi, Hirohito; and Sato, Katsunobu, to Sumitomo Chemical Company, Limited. 2-Cyano-4-nitro-6-chlorophenylazo 3-acetyl-or propionylamino-N,N-di-n-pentyl or hexylanilines. 4,536,569, Cl. 534-575.000.
Hashimoto, Shigebumi: *See*—
Sakakibara, Shumpei; Yugari, Yasumi; and Hashimoto, Shigebumi, 4,536,395, Cl. 514-7.000.
Hashimoto, Yutaka: *See*—
Kamei, Masayuki; Endo, Tomio; and Hashimoto, Yutaka, 4,536,298, Cl. 252-8.050.
Haslanger, Martin F.: *See*—
Das, Jagabandhu; and Haslanger, Martin F., 4,536,513, Cl. 514-469.000.
Das, Jagabandhu; and Haslanger, Martin F., 4,536,514, Cl. 514-469.000.
Hasler, Hans: *See*—
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Hatfield, Jim J. Automatic jaw control for reversible power tool. 4,536,113, Cl. 409-234.000.
Hatfield, John F. Computer keyboard educational toy. 4,536,160, Cl. 434-227.000.
Hattendorff, Horst D.: *See*—
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Hattori, Hideaki: *See*—
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Hattori, Kiyoshi; and Myers, John H., to El Paso Polyolefins Company. Heat-sterilizable polyolefin compositions and articles manufactured therefrom. 4,536,549, Cl. 525-240.000.
Hattori, Kyo: *See*—
Ohumi, Takeharu; Kurahashi, Yasuo; Hattori, Kyo; and Sakurai, Kazuhiro, 4,535,815, Cl. 137-625.480.
Hattori, Yukiro: *See*—
Friedman, Harry; Sengoku, Isao; Hattori, Yukiro; and Isikawa, Minoru, 4,535,539, Cl. 30-161.000.
Hauge, Raymond C.; and Mycynek, Victor G., to Zenith Electronics Corporation. Compensated inverting/noninverting differential amplifier. 4,536,717, Cl. 330-254.000.
Haugwitz, Rudiger D.: *See*—
Sundeen, Joseph E.; Haugwitz, Rudiger D.; and Sprague, Peter W., 4,536,501, Cl. 514-225.000.
Hauke, Dieter: *See*—
Heubach, Rainer; Marx, Reinhard; Kunz, Peter; and Hauke, Dieter, 4,536,385, Cl. 423-621.000.
Hauni-Werke Korber & Co. KG.: *See*—
Lindemann, Rolf, 4,535,792, Cl. 131-281.000.
Hauptman, Murray L. Threadless feed screw. 4,535,643, Cl. 74-89.000.
Haury, Andre : *See*—
Belbel, Elie; Blanchard, Christian; Fechant, Louis; Haury, Andre ; and Lauraire, Michel, 4,536,630, Cl. 200-151.000.
Hauser, Oscar G.; Lysy, Dusan G.; and Koehler, Richard F., Jr., to Xerox Corporation. Developer material end of life sensing. 4,536,080, Cl. 355-14.00D.
Hawkeye Container Company: *See*—
Eberle, John W., 4,535,586, Cl. 53-432.000.

Hayakawa, Masao; Maeda, Takamichi; and Kumura, Masao, to Sharp Kabushiki Kaisha. Lead electrode connection in a semiconductor device. 4,536,786, Cl. 357-68.000.

Hayashi, Kazuhiko: *See*—
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Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,535,865, Cl. 180-177.000.

Hayashi, Motoshige; Kobayashi, Toshirou; Yoshii, Motokazu; Tsubone, Masahiro; and Ishikawa, Mikio, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Method and apparatus for preparing multi-cellular foamed board of thermoplastic resin. 4,536,357, Cl. 264-53.000.

Hayashi, Takeshi, to Kyoeizoki Co., Ltd. Apparatus for containing easily solidifying powder and particles. 4,535,942, Cl. 241-36.000.

Hayes, John C. Probe search test light and continuity tester. 4,536,705, Cl. 324-53.000.

Hayes, Roger: *See*—
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; Mackinnon, John W. M.; Judd, Duncan B.; and Hayes, Roger, 4,536,508, Cl. 514-383.000.

Hayter, Walter R.: *See*—
Thurlow, Norman C.; Hayter, Walter R.; and Schockner, Richard C., 4,536,653, Cl. 250-390.000.

Haze, Setsuo, to Kabushiki Kaisha Ishida Koki Seisakusho. Span adjusting method and apparatus. 4,535,857, Cl. 177-50.000.

Hazeltine Corporation: *See*—
Frazita, Richard F., 4,536,766, Cl. 343-372.000.
Loughlin, Bernard D., 4,536,885, Cl. 381-15.000.

Hazemeijer B.V.: *See*—
van der Scheer, Derk, 4,536,735, Cl. 337-159.000.

Hebert, Philip J.; and Blanchette, Leon G., to LeBlanco Limited. Broiler oven. 4,535,750, Cl. 126-41.00B.

Hehl, Karl. Reversing mechanism for safety gate of injection molding machine. 4,536,144, Cl. 425-154.000.

Heidenescher, Hermann: *See*—
Appel, Hans; and Heidenescher, Hermann, 4,535,830, Cl. 160-299.000.

Heiligman, Randy B.; and Keller, Paul. Dispenser with squeeze-bulb actuator. 4,535,918, Cl. 222-185.000.

Hekal, Ihab M., to Continental Can Company. Method for preparing polar thermoplastic resin compositions having improved gas barrier properties. 4,536,425, Cl. 428-35.000.

Helderman, J. Frank. Anchor apparatus for insertion into a pre-formed hole. 4,536,115, Cl. 411-17.000.

Helgstrand, Åke J. E.; Johansson, Karl N. G.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran B., to Astra Lakemedel Aktiebolag. Phosphonoformic acid esters. 4,536,400, Cl. 514-120.000.

Hellwig, Klaus-Dieter: *See*—
Kaufmann, Lothar; and Hellwig, Klaus-Dieter, 4,536,383, Cl. 423-508.000.

Helmers, Michael: *See*—
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Hemex, Inc.: *See*—
Klawitter, Jerome J.; and Cromie, Harry W., 4,535,483, Cl. 623-2.000.

Henderson, David: *See*—
Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, 4,536,401, Cl. 514-173.000.

Henderson, John G. N.: *See*—
Maturo, Robert J.; Chin, Danny; and Henderson, John G. N., 4,536,797, Cl. 358-192.100.

Hendriks, Ivo G. M.; and Stals, Theo, to Teepak, Inc. Method and device for everting flexible tubular member. 4,535,506, Cl. 17-45.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Blum, Helmut, 4,536,348, Cl. 260-502.40P.
Borggrefe, Gerhard; and Hase, Christian, 4,536,325, Cl. 252-314.000.

Hennig, Eberhard, to Dr. -Ing. Rudolf Hell GmbH. Method and apparatus for intensifying contrast in printing formats. 4,536,803, Cl. 358-299.000.

Henrick, Clive A.: *See*—
Lee, Shy-Fuh; and Henrick, Clive A., 4,536,355, Cl. 260-944.000.

Henrion, Alain: *See*—
Verton, Jose ; and Henrion, Alain, 4,535,500, Cl. 15-250.230.

Henriott, Jay M.; and Hostetter, David L., to Kimball International, Inc. Wire or line manager. 4,535,703, Cl. 108-50.000.

Heraeus Cermalloy, Inc.: *See*—
Hankey, Dana L., 4,536,328, Cl. 252-518.000.

Herb, Carl C., to Carrier Corporation. Actuator for a heating/cooling diffuser. 4,535,932, Cl. 236-49.000.

Hercules Incorporated: *See*—
Haas, Lawrence W., 4,536,236, Cl. 149-19.920.

Herman, David E.: *See*—
Burgess, Lester E.; Fox, Karl M.; McGarry, Phillip E.; and Herman, David E., 4,536,372, Cl. 422-187.000.

Herman, George R.; and Martin, William A., to Herman, George R. Wind lift generator. 4,536,125, Cl. 415-5.000.

Hernandez, Luis A.; and Gonzalez, Jorge E. Croquette machine. 4,536,146, Cl. 425-297.000.

Herring, William P.: *See*—
Pawelzik, Manfred; Herring, William P.; and Kostorz, Jan R., 4,535,814, Cl. 137-625.170.

Herrmann, John M.; and Voisin, Suzanne M., to Trilogy Computer Development Partners, Ltd. Wafer transfer device. 4,536,122, Cl. 414-404.000.

Herron, John M.: *See*—
Gur, David; Herron, John M.; and Pedersen, Robert H., 4,535,780, Cl. 128-659.000.

Hertenstein, Ulrich; Mildenberger, Hilmar; Sachse, Burkhard; and Hartz, Peter, to Hoechst Aktiengesellschaft. 1,1-Diaryl-2-azolylethanes and preparations containing these compounds. 4,536,509, Cl. 514-383.000.

Hertz, C. Hellmuth: *See*—
Hertz, Carl H., 4,535,741, Cl. 123-444.000.

Hertz, Carl H., to Hertz, C. Hellmuth. Fuel metering method and device. 4,535,941, Cl. 123-444.000.

Herweg, Arnulf. Method and apparatus for displaying one or more measurement values of arbitrary measurement variables on a screen. 4,536,707, Cl. 324-121.00R.

Heskins, Michael: *See*—
Guillet, James E.; Heskins, Michael; and Murray, D. Gary, 4,536,294, Cl. 210-730.000.

Hess, Fritz; and Dalliard, Fernand, to Ateliers de Constructions Mecaniques de Vevey S.A. Articulated railway vehicle. 4,535,702, Cl. 105-4.00R.

Hettinger, William P., Jr.; and Lewis, James E., to Ashland Oil, Inc. Large pore catalysts for heavy hydrocarbon conversion. 4,536,281, Cl. 208-113.000.

Hetz, Walter, to Siemens Aktiengesellschaft. Manually operated ultrasound applicator. 4,535,781, Cl. 128-660.000.

Heubach, Rainer; Marx, Reinhard; Kunz, Peter; and Hauke, Dieter, to Goslarer Farbenwerke Dr. Hans Heubach GmbH & Co. KG. Method and apparatus for the production of industrial lead oxide. 4,536,385, Cl. 423-621.000.

Hewing GmbH & Co.: *See*—
Bliefert, Claus; Boldhaus, Hans-Michael; and Hoffmann, Manfred, 4,536,266, Cl. 204-159.180.

Hewitt, William R.: *See*—
Saxton, Robert W.; Hewitt, William R.; and Nelligan, Jerome M., 4,536,108, Cl. 408-230.000.

Hewlett-Packard Company: *See*—
Chen, Devereaux C.; and Fu, Horng-Sen, 4,535,528, Cl. 29-571.000.

Heyman, Duane A., to BASF Wyandotte Corporation. Polymer dispersions and their uses. 4,536,557, Cl. 528-52.000.

Hi-Tech Engineering, Inc.: *See*—
Huiber, Otto A., 4,536,134, Cl. 417-360.000.

Hidaka, Tuneo: *See*—
Nishizawa, Tsutomu; Tukahara, Ryoichi; Morinaka, Ryoichi; and Hidaka, Tuneo, 4,536,320, Cl. 252-299.100.

Hideo, Hisamoto, to Matsushita Electric Works, Ltd. Circuit breaker. 4,536,726, Cl. 335-23.000.

Hidle, Jerry, to Pandhandle Industries, Inc. Paper towel insert and dispenser. 4,535,947, Cl. 242-55.200.

Higashino, Takashi: *See*—
Sato, Kan-ichi; Yamanishi, Akio; and Higashino, Takashi, 4,535,831, Cl. 164-33.000.

Higgins, Edward, Jr.: *See*—
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Higgins, Thair L.: *See*—
Klingensmith, G. Bruce; Whitehead, Richard O.; and Higgins, Thair L., 4,536,537, Cl. 524-481.000.

Highberger, Samuel M. Body support. 4,536,032, Cl. 297-439.000.

Highlight Industries, Inc.: *See*—
Riemenschneider, Paul K., III, 4,535,951, Cl. 242-754.000.

Hignett, Geoffrey J.; Rowbottom, Kenneth T.; and Sanderson, William R., to Interox Chemicals Limited. Peroxygen compound. 4,536,313, Cl. 252-100.000.

Hijiya, Toyoto: *See*—
Yoneda, Kiyoshi; Takeuchi, Hiroshi; Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,536,842, Cl. 364-424.000.

Hileman, Gregory A.: *See*—
Flynn, Robert G.; Pitkin, Courtney G.; and Hileman, Gregory A., 4,536,399, Cl. 514-63.000.

Hill, John W., to Commonwealth of Australia, The. Minesweeping. 4,535,716, Cl. 114-221.00R.

Hill, Royce W.: *See*—
Ramey, Carl; Hill, Royce W.; and Beijen, James H., 4,535,925, Cl. 227-55.000.

Hille, Martin: *See*—
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Hilliard, William G.: *See*—
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Hilton-Davis Chemical Co., The: *See*—
Crounse, Nathan N., 4,536,570, Cl. 534-819.000.
Hung, William M.; and Jefferies, Patrick J., 4,536,367, Cl. 422-37.000.
Hung, William M.; and Knox, Jack M., 4,536,368, Cl. 422-37.000.

Himsley, Alexander; and Bennett, John A., to Himsley Engineering Limited. Piping for use in liquid collection and distribution. 4,536,287, Cl. 210-293.000.

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Himsley, Alexander; and Bennett, John A., 4,536,287, Cl. 210-293.000.

Hinkel, Jerald J.: *See*—
Settineri, William J.; Charles, John G.; Hinkel, Jerald J.; and Malone, Bradley P., 4,536,222, Cl. 134-5.000.
Hinomaru Seni Co., Ltd.: *See*—
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Hioki, Katsuhiko: *See*—
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Hiroishi, Akihiko, to Sord Computer Systems, Inc. Method of and apparatus for controlling the display of video signal information. 4,536,856, Cl. 364-900.000.
Hirota, Akira; Miyahara, Hiroyuki; and Kosaka, Yoshiteru, to Victor Company of Japan, Ltd. Video memory device. 4,536,795, Cl. 358-160.000.
Hisadomi, Masaru: *See*—
Kurihara, Norimitsu; Suzuki, Toshiyasu; Iwanaga, Takashi; and Hisadomi, Masaru, 4,535,547, Cl. 33-356.000.
Hisey, Durward A., to Hy-C Company, Inc. Chimney cap. 4,535,686, Cl. 98-67.000.
Hitachi, Ltd.: *See*—
Kubota, Hitoshi; Tanaka, Minoru; and Aiuchi, Susumu, 4,536,419, Cl. 427-255.500.
Matsuzawa, Toshiharu; Douta, Kikuo; Iwayanagi, Takao; and Yanazawa, Hiroshi, 4,536,421, Cl. 427-282.000.
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Oguino, Masanori, 4,536,056, Cl. 350-128.000.
Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,536,131, Cl. 417-102.000.
Sakka, Kenji, 4,535,593, Cl. 60-646.000.
Yanagita, Tomoatsu, 4,536,854, Cl. 364-749.000.
Hitachi Maxell, Ltd.: *See*—
Sumiya, Kenji; Togawa, Fumio; and Saito, Osamu, 4,536,444, Cl. 428-340.000.
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Hixenbaugh, D. Wayne: *See*—
Troutman, Samuel J., Jr.; and Hixenbaugh, D. Wayne, 4,535,634, Cl. 73-747.000.
Hlava, Lorens G., to Brunswick Corporation. Two piece molded adjustable rod handle. 4,535,561, Cl. 43-22.000.
Hliboki, Joseph G.; and Staudenmaier, Paul, to Teaneck Graphics Corp. Multiple vacuum frame unit. 4,536,085, Cl. 355-93.000.
Hobbs, James W., to Phillips Petroleum Company. Control of a cracking furnace. 4,536,606, Cl. 585-650.000.
Hoechst Aktiengesellschaft: *See*—
Bungert, Theodor, 4,536,104, Cl. 406-183.000.
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Puls, Craig, 4,536,173, Cl. 493-149.000.
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Shiga, Mitsuo, 4,535,866, Cl. 180-215.000.
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Hope, Bjorn R. Apparatus for level measurements. 4,535,628, Cl. 73-290.00V.
Horiuchi, Hajimu; and Sakaguchi, Akira, to Kawasaki Jukogyo Kabushiki Kaisha. Method for preventing the discoloration of areas around indentation in spot welding. 4,536,637, Cl. 219-117.100.
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Hughes, David C., to Milton Bradley Company. Rocking mechanism. 4,536,167, Cl. 446-396.000.
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Huiber, Otto A., to Hi-Tech Engineering, Inc. Piston seal access apparatus. 4,536,134, Cl. 417-360.000.
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Hyde, James L., to Discovision Associates. Method and means for drying coatings on heat sensitive materials. 4,535,548, Cl. 34-4.000.
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Strain, Don R., 4,536,198, Cl. 55-33.000.
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McCandliss, Russell J.; Eastwood, Barbara J.; and Milch, Robert A., 4,536,207, Cl. 71-88.000.
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Iijima, Yoshio, to Daido Metal Company Ltd. Method for producing a connecting rod for a radial piston motor. 4,535,517, Cl. 29-156.50A.
Ijntema, Johannes, to U.S. Philips Corporation. Device for signalling a specific charge condition of an accumulator battery. 4,536,757, Cl. 340-636.000.
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Farrell, W. James; and Diehl, Werner K., 4,536,110, Cl. 409-11.000.
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Knirsch, Franco; Gianolini, Giovanni; Dagna, Gian D.; and Buat, Mario, 4,536,776, Cl. 346-140.00R.
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Gault, Roger T., 4,535,647, Cl. 74-543.000.
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Ingram, Wayne A.; Johnson, Stephen L.; and Coleman, Thomas E., to Siemens-Allis, Inc. Electric panel board having an improved extruded base pan configuration. 4,536,823, Cl. 361-355.000.
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Prosenbauer, Otto, 4,535,504, Cl. 17-1.00G.
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Gervais, Alain; Vermeire, Daniel; Cerf, Olivier; and Toux, Jacques, 4,535,621, Cl. 73-59.000.
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Amendola, Albert; Christensen, Richard G.; and Yereance, John G., Jr., 4,536,470, Cl. 430-314.000.
Bahr, Dietrich J.; Burckardt, Karl-Heinz; Goldrian, Gottfried; Rudolph, Volker; and Spruth, Wilhelm G., 4,536,769, Cl. 346-1.100.
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Cranford, Hayden C., Jr.; and Garvin, Stacy J., 4,536,720, Cl. 331-57.000.
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Shen, John C. S., 4,536,451, Cl. 428-418.000.
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Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., 4,536,330, Cl. 252-522.00R.
Mookherjee, Braja D.; Chant, Bernard J.; Evers, William J.; Wilson, Richard A.; Zampino, Michael J.; and Vock, Manfred H., 4,536,583, Cl. 549-1.000.
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Capo, James L., 4,535,928, Cl. 229-16.00R.
Lisnyansky, Khaim, 4,535,950, Cl. 242-66.000.
Murdick, Brian K.; and Haase, William H., 4,535,891, Cl. 206-564.000.
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Cyrot, Luc P., 4,536,728, Cl. 335-182.000.
Morton, Steven G., 4,536,855, Cl. 364-786.000.
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Mehl, Wolfgang, 4,536,462, Cl. 430-106.000.
InterNorth, Inc.: *See*—
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Hignett, Geoffrey J.; Rowbottom, Kenneth T.; and Sanderson, William R., 4,536,313, Cl. 252-100.000.
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Ireland, Edward J. Dental matrix band. 4,536,155, Cl. 433-39.000.
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Ito, Tatsuo; Oba, Kazunori; Fukuyasu, Harumi; Niwa, Tomizo; Shomura, Takashi; and Kazuno, Yuzo, to Meiji Seika Kaisha Ltd. Antiviral agents. 4,536,398, Cl. 514-43.000.
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Jablway, Ali N.; and Mitchell, Alexander M., to AT&T Technologies, Inc. Method and apparatus for testing cable wire connected to terminals at a remote location. 4,536,703, Cl. 324-52.000.
Jackson, Dawn A.: *See*—
Wheeler, Jennifer M.; and Jackson, Dawn A., 4,536,821, Cl. 361-321.000.
Jacob, Eugene E.: *See*—
Livingston, William D.; and Jacob, Eugene E., 4,536,877, Cl. 370-94.000.
Jacobine, Anthony F.: *See*—
Fabrizio, Louis F.; Lin, Samuel O. S.; and Jacobine, Anthony F., 4,536,265, Cl. 204-159.130.
Jacobs, John W.: *See*—
Bookout, Russell J.; Pearson, Bernard A.; and Jacobs, John W., 4,536,137, Cl. 417-390.000.
Jacobsen, Finn, to Kamyr AB. Method for treatment of suspensions in movement. 4,535,497, Cl. 8-156.000.
Jacobsen, Finn; Molbaek, Jens J.; Zangenberg, Jan; and Dam, Poul S., to Danfoss A/S. Thermal servo-motor, particularly for valves. 4,535,590, Cl. 60-531.000.
Jageler, Alfred H., to Standard Oil Company (Indiana). Method and apparatus for obtaining selected samples of formation fluids. 4,535,843, Cl. 166-250.000.
Jagenberg AG: *See*—
Buchholz, Rainer; Tomashauser, Josef; Zodrow, Rudolf; and Mohn, Hans-Werner, 4,536,247, Cl. 156-477.100.
Jakobs, Rudolf: *See*—
Albrecht, Johannes; Jakobs, Rudolf; Turna, Osman; Vierrath, Helmut; Weil, Manfred; and Zapke, Klaus, 4,536,193, Cl. 48-77.000.
James Howden & Company: *See*—
Groeneveld, Michiel J.; Verver, Albert B.; and Van Swaaij, Willibrordus P. M., 4,535,551, Cl. 34-170.000.
Jameson, Calvin R., to Nordson Corporation. Hot melt adhesive system. 4,535,919, Cl. 222-190.000.
Jankot, Alan L., to United Technologies Corporation. Turbine blade with disk rim shield. 4,536,129, Cl. 416-95.000.
Janson, Bengt G., to AB Spray Technics S.T. Method for separating coarse particles from a liquid. 4,536,295, Cl. 210-804.000.
Japan Bano'k Co., Ltd.: *See*—
Furutsu, Akira, 4,535,926, Cl. 227-67.000.
Jaqua, Vance W., to Rockwell International Corporation. Method of forming small-diameter channel within an object. 4,535,518, Cl. 29-157.00C.
Jaquet, Henri, to Jaquet Orthopedic S.A. External bone-anchoring element. 4,535,763, Cl. 128-92.00A.
Jaquet Orthopedic S.A.: *See*—
Jaquet, Henri, 4,535,763, Cl. 128-92.00A.
Jaskolski, Stanley V.: *See*—
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,536,884, Cl. 378-119.000.
Jastram-Werke GmbH KG, Firma: *See*—
Petersen, Fred, 4,535,714, Cl. 114-162.000.
Jefferies, Patrick J.: *See*—
Hung, William M.; and Jefferies, Patrick J., 4,536,367, Cl. 422-37.000.
Jenkins, Thomas E., to General Electric Company. Method of assembling a rack-supporting channel and stop. 4,535,524, Cl. 29-453.000.
Jenner, Frank H.: *See*—
Smith, John L.; and Jenner, Frank H., 4,536,051, Cl. 339-117.00P.
Jensen, Garold K. Comprehensive intruder-environmental hazard detection, control, and action system. 4,536,747, Cl. 340-502.000.
Jensen, Susan: *See*—
Wolfe, Saul; Westlake, Donald; and Jensen, Susan, 4,536,476, Cl. 435-183.000.
Jeong, Seo Y.: *See*—
Kim, Wan S.; Jeong, Seo Y.; and McRea, James C., 4,536,572, Cl. 536-179.000.
Jeppsson, Jan-Bertil: *See*—
Claren, Jan S.; Jeppsson, Jan-Bertil; and Staehr, Peter R., 4,535,635, Cl. 73-756.000.
Jerome, Jonathan A.; Neu, Frank D.; and Wohlmut, Peter G., to Videonics of Hawaii, Inc. Information retrieval system and apparatus. 4,536,866, Cl. 369-112.000.
Jet AER Corporation: *See*—
Friedman, Harry; Sengoku, Isao; Hattori, Yukiro; and Isikawa, Minoru, 4,535,539, Cl. 30-161.000.
JGC Corporation: *See*—
Maeda, Keikichi; Iijima, Takahiro; and Sato, Eiichi, 4,536,455, Cl. 428-629.000.
Jidosha Kiki Co., Ltd.: *See*—
Kajikawa, Hiromi; and Sugita, Masao, 4,535,519, Cl. 26-157.10R.
Kobayashi, Michio, 4,535,591, Cl. 60-554.000.
Jikihara, Tetsuo; Oda, Masatsugu; Natsume, Bunji; Watanabe, Hisao; and Suzuki, Seiichi, to Mitsubishi Chemical Industries Ltd. N-(3-substituted oxyphenyl)tetrahydrophthalimides and herbicidal composition. 4,536,209, Cl. 71-96.000.
Jillie, Don W.: *See*—
Kroger, Harry; Jillie, Don W.; and Smith, Lawrence N., 4,536,414, Cl. 427-38.000.
Jin, Sungho; and Tiefel, Thomas H., to AT&T Bell Laboratories. Fe-Ni-Mo magnet alloys and devices. 4,536,229, Cl. 148-31.550.

Jochems, Pieter J. W., to U.S. Philips Corporation. Method of making semiconductor devices by forming an impurity adjusted epitaxial layer over out diffused buried layers having different lateral conductivity types. 4,535,529, Cl. 29-571.000.

Johanson, Leonard T.; and Forrester, Harry L., to Dicken Manufacturing Company. Check valve. 4,535,808, Cl. 137-543.000.

Johansson, Karl N. G.: *See—*
Helgstrand, Åke J. E.; Johansson, Karl N. G.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran B., 4,536,400, Cl. 514-120.000.

Johansson, Magnus: *See—*
Brynielsson, Thore; Tomasson, Tom; Ahlberg, Leif; and Johansson, Magnus, 4,536,004, Cl. 280-166.000.

Johnson, Chris G.: *See—*
Baker, Donn; Clarke, John E.; and Johnson, Chris G., 4,536,052, Cl. 339-126.00R.

Johnson, Gerald W. Surgical instrument for suction lipolysis. 4,536,180, Cl. 604-268.000.

Johnson, Harlan: *See—*
Bull, Jeffrey F.; Johnson, Harlan; Karg, James F.; and Winiasz, Michael E., 4,535,674, Cl. 87-29.000.

Johnson, Marion: *See—*
Murley, Jackie D.; and Johnson, Marion, 4,536,148, Cl. 425-387.100.

Johnson, Robert A., to Magnetic Peripherals. Apparatus and method for shielding magnetic heads during a sputtering operation. 4,536,270, Cl. 204-192.00R.

Johnson, Robert L.: *See—*
Roberts, Jack; and Johnson, Robert L., 4,535,486, Cl. 623-22.000.

Johnson, Stephen L.: *See—*
Ingram, Wayne A.; Johnson, Stephen L.; and Coleman, Thomas E., 4,536,823, Cl. 361-355.000.

Johnson, Theodore R.: *See—*
Kitrilakis, Sotiris; and Johnson, Theodore R., 4,535,778, Cl. 128-635.000.

Johnston, Ralph H.; Munden, Curtis D.; and Sheldrake, Leonard J., to General Motors Corporation. Vehicle electrical energy management system. 4,536,697, Cl. 322-14.000.

Jones, Addison B.; and Plonski, Siegfried G., to Rockwell International Corporation. Embedded absorber X-ray mask and method for making same. 4,536,882, Cl. 378-35.000.

Jones, Dixon J. Connector device. 4,536,101, Cl. 403-389.000.

Jones, Edward M., Jr., to Chemical Research & Licensing Company. Contact structure for use in catalytic distillation. 4,536,373, Cl. 422-211.000.

Jones, Harold; and Bell, David J., to Link 51 Limited. Shelving. 4,535,898, Cl. 211-153.000.

Jones, Mary A.; and Tucker, Donna L. Fitted sheet for lounge chair. 4,536,028, Cl. 297-224.000.

Jones, Stephen H., to Nordson Corporation. Skin packaging machine having microprocessor-based control. 4,535,582, Cl. 53-52.000.

Jones, Thomas F.; and Morehead, Jesse L. Sighting apparatus. 4,535,544, Cl. 33-265.000.

Jordan, Ross W. Log holder for use in splitting logs. 4,535,980, Cl. 269-102.000.

Joy Manufacturing Company: *See—*
Babbitt, Brett A.; Le, Tri C.; and Noble, Bruce P., 4,535,967, Cl. 251-54.000.

Judd, Duncan B.: *See—*
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; Mackinnon, John W. M.; Judd, Duncan B.; and Hayes, Roger, 4,536,508, Cl. 514-383.000.

Jung, Gerhard: *See—*
Cooks, Graham; Story, Michael S.; Jung, Gerhard; and Dobberstein, Peter, 4,536,652, Cl. 250-281.000.

Junge, Bodo; and Muller, Lutz, to Baker Aktiengesellschaft. Saturated aminocyclitol derivatives, their preparation and medicaments containing these compounds. 4,536,493, Cl. 514-25.000.

Justus, Edgar J., to Beloit Corporation. Extended nip press. 4,536,255, Cl. 162-358.000.

KabiVitrum AB: *See—*
Bergwitz-Larsen, Carl-Aage; and Osterlund, Rolf G. L., 4,536,495, Cl. 514-54.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Haze, Setsuo, 4,535,857, Cl. 177-50.000.
Izumi, Asashiro; Mikami, Yoshiharu; and Yamada, Seiji, 4,535,855, Cl. 177-1.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Baba, Kiyokazu, 4,536,118, Cl. 414-43.000.
Ishikawa, Tadayuki, 4,536,195, Cl. 51-293.000.
Nakamura, Masaru; and Kuse, Takashi, 4,535,681, Cl. 91-527.000.
Sato, Kan-ichi; Yamanishi, Akio; and Higashino, Takashi, 4,535,831, Cl. 164-33.000.

Kabushiki Kaisha Masuda Seisakusho: *See—*
Masuda, Masao, 4,535,611, Cl. 68-202.000.

Kabushiki Kaisha Ohmori Seisakusho: *See—*
Omori, Hatsutaro, 4,535,953, Cl. 242-84.21R.

Kabushiki Kaisha Suwa Seikosha: *See—*
Okonogi, Itaru; and Shimoda, Tatsuya, 4,536,233, Cl. 148-101.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See—*
Matsunami, Muneharu; Tsuge, Hiroshi; Kubota, Tatsushi; and Ogawa, Hisashi, 4,536,010, Cl. 280-802.000.

Kabushiki Kaisha Toshiba: *See—*
Ohtake, Yasuhisa; Tanaka, Hiroshi; and Oka, Koichiro, 4,536,226, Cl. 148-12.00C.

Kachik, Robert H., to United States Steel Corporation. Aluminothermic reduction reaction mixture. 4,536,237, Cl. 149-37.000.

Kaehler, James A.: *See—*
Erickson, Mark R.; and Kaehler, James A., 4,536,847, Cl. 364-516.000.

Kahling, Joachim: *See—*
Engel, Wolfhard; Bauer, Eckhart; Trummlitz, Gunter; Danneberg, Peter; and Kahling, Joachim, 4,536,402, Cl. 514-443.000.

Kaire, Jean C., to Thomson-CSF. Microphone or mouthpiece signal suppression circuit. 4,536,616, Cl. 179-81.00A.

Kaiser, William J.: *See—*
Logothetis, Eleftherios M.; and Kaiser, William J., 4,536,241, Cl. 156-89.000.

Kajikawa, Hiromi; and Sugita, Masao, to Jidosha Kiki Co., Ltd. Method of manufacturing a valve sleeve. 4,535,519, Cl. 26-157.10R.

Kakalec, Robert J.: *See—*
Basarath, Brian A.; and Kakalec, Robert J., 4,536,715, Cl. 330-2.000.

Kakei, Tsutomu: *See—*
Masuda, Takanori; Kakei, Tsutomu; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,536,264, Cl. 204-129.430.

Kali und Salz AG: *See—*
Loblich, Karl-Richard, 4,536,376, Cl. 423-306.000.

Kaluzhsky, Nikolai A.; Badaliants, Khoren A.; Kostin, Ivan M.; Zatulovsky, Isaak A.; Korneev, Valentin I.; Andreev, Vladimir V.; Kuzmin, Boris A.; Sizyakov, Viktor M.; Shmorgunenko, Nikolai S.; Krochevsky, Vladislav A.; and Alexeev, Alexei I., to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Aljuminievoi, Magnievoi I Elektrodnoi Promyshlennosti. Cement for the manufacture of cores and moulds and method for preparing same. 4,536,216, Cl. 106-38.300.

Kalynchuk, Daniel G.: *See—*
Papadakis, Nicholas; and Kalynchuk, Daniel G., 4,536,274, Cl. 204-433.000.

Kamei, Masayuki; Endo, Tomio; and Hashimoto, Yutaka, to Dainippon Ink and Chemicals, Inc.; and Kawamura Institute of Chemical Research. Aqueous foam fire extinguisher. 4,536,298, Cl. 252-8.050.

Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takugi, to Pioneer Electronic Corporation. Cassette tape player having supply and take-up motors positioned vertically above a cassette receiving mechanism. 4,536,811, Cl. 360-96.600.

Kamino, Yukishige: *See—*
Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,536,131, Cl. 417-102.000.

Kaminski, Elton G., to Stolle Corporation, The. Method for reducing ice and snow build-up on the reflecting surfaces of dish antennas. 4,536,765, Cl. 343-704.000.

Kaminski, Joan M.: *See—*
Horodysky, Andrew G.; and Kaminski, Joan M., 4,536,309, Cl. 252-33.000.

Kamiya, Yoshinori: *See—*
Narita, Ryuhei; Aida, Hiroyuki; and Kamiya, Yoshinori, 4,535,503, Cl. 16-382.000.

Kamp, Heinz: *See—*
Rohner, Joachim; and Kamp, Heinz, 4,535,945, Cl. 242-35.60R.

Kamuro, Setsufumi, to Sharp Kabushiki Kaisha. Cross-coupled inverters static random access memory. 4,536,859, Cl. 365-154.000.

Kamyr AB: *See—*
Jacobsen, Finn, 4,535,497, Cl. 8-156.000.

Kanayama, Kenji; and Kinkori, Shuzo, to Nippondenso Co., Ltd. Flat type rotary electric machine. 4,536,672, Cl. 310-268.000.

Kanbe, Junichiro; Shirai, Shigeru; Misumi, Teruo; Saitoh, Keishi; and Osato, Yoichi, to Canon Kabushiki Kaisha. Photoconductive member. 4,536,460, Cl. 430-57.000.

Kanbe, Junichiro: *See—*
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,536,459, Cl. 430-57.000.

Kanda, Nobuo: *See—*
Kondo, Mitsuru; Iwasaki, Hiroshi; Omura, Haruo; and Kanda, Nobuo, 4,536,220, Cl. 106-21.000.

Kandybowski, Steven J.; and Sucheski, Matthew M., to AMP Incorporated. Stamped and formed stacking device for circuit boards and a method for making. 4,536,055, Cl. 339-258.00R.

Kaneaki, Tetsuhiko: *See—*
Kawamoto, Kinji; Tsukamoto, Masao; Murase, Kazuhiro; Kaneaki, Tetsuhiko; and Nikaido, Masataka, 4,536,853, Cl. 364-718.000.

Kaneda, Yutaka; and Ohga, Juro, to Nippon Telegraph & Telephone Public Corporation. Microphone-array apparatus and method for extracting desired signal. 4,536,887, Cl. 381-92.000.

Kaneko, Youji, to Casio Computer Co., Ltd. Touch response apparatus for electronic musical apparatus. 4,535,669, Cl. 84-1.260.

Kano, Hikaru: *See—*
Fujiki, Toshiaki; and Kano, Hikaru, 4,535,581, Cl. 52-746.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Kondo, Mitsuru; Iwasaki, Hiroshi; Omura, Haruo; and Kanda, Nobuo, 4,536,220, Cl. 106-21.000.

Kao Soap Co., Ltd.: *See—*
Suzuki, Toshiyuki; Nakamura, Tohru; and Tsutsumi, Hisao, 4,536,519, Cl. 514-785.000.

Kardys, Joseph A., to Pfizer Inc. Process and intermediates for production of benzothiazine carboxamides. 4,536,573, Cl. 544-49.000.

Karg, Daniel W.: *See—*
Bull, Jeffrey F.; Karg, Daniel W.; and Winiasz, Michael E., 4,535,675, Cl. 87-29.000.

Karg, James F.: *See—*
Bull, Jeffrey F.; and Winiasz, Michael E., 4,535,672, Cl. 87-29.000.
Bull, Jeffrey F.; Johnson, Harlan; Karg, James F.; and Winiasz, Michael E., 4,535,674, Cl. 87-29.000.

Bull, Jeffrey F.; Karg, Daniel W.; and Winiasz, Michael E., 4,535,675, Cl. 87-29.000.
Winiasz, Michael E., 4,535,673, Cl. 87-29.000.
Karlsson, Per G., to Alfa-Laval Separation AB. Assembly comprising a vortex fluidic device for separating a mixture of a liquid phase and a relatively heavy, solid phase. 4,536,285, Cl. 210-96.100.
Kasahara, Shin-ichi: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,536,631, Cl. 219-10.770.
Kasai, Yoshiaki: *See*—
Kudo, Ichiro; Kasai, Yoshiaki; and Yuasa, Masaharu, 4,535,739, Cl. 123-425.000.
Kasei Optonix, Ltd.: *See*—
Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, 4,536,436, Cl. 428-212.000.
Kasten, Alan J., to Harris Corporation. Polysilicon thin films of improved electrical uniformity. 4,536,231, Cl. 148-33.100.
Kasubuchi, Takeshi; Hara, Takeo; and Ozawa, Kaoru, to Sharp Kabushiki Kaisha. Data control system for storing digital and audio information on a magnetic tape. 4,536,804, Cl. 360-4.000.
Kasuya, Yoshihiro, to Nippon Electric Co., Ltd. Integrated logic circuit adapted to performance tests. 4,536,881, Cl. 377-70.000.
Katayama, Yoshio: *See*—
Hasegawa, Makoto; Makimoto, Mitsuo; Yamashita, Sadahiko; and Katayama, Yoshio, 4,536,724, Cl. 331-177.00V.
Kater, John A. R. Measurement of body fluid chemistry. 4,535,786, Cl. 128-760.000.
Katkocin, Dennis M.; Word, Nancy S.; and Yang, Shiow-Shong, to CPC International Inc. Thermostable glucoamylase and method for its production. 4,536,477, Cl. 435-205.000.
Kato, Hirohiko; Ichijima, Seiji; Adachi, Keiichi; and Watanabe, Toshiyuki, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,536,472, Cl. 430-505.000.
Kato, Hiroshi; and Kubota, Hiromitsu, to Victor Company of Japan, Ltd. Display device for a magnetic tape recording and/or reproducing apparatus. 4,536,807, Cl. 360-72.300.
Kato, Yoshiaki: *See*—
Nawa, Akiyoshi; and Kato, Yoshiaki, 4,536,634, Cl. 219-74.000.
Katsura, Tadashi: *See*—
Masuko, Fujio; and Katsura, Tadashi, 4,536,599, Cl. 564-124.000.
Katz, Maurice, to Creusot-Loire. Sealing device for hydraulic energy dissipator of the telescopic type. 4,535,998, Cl. 277-212.0FB.
Kaufmann, Lothar; and Hellwig, Klaus-Dieter, to Degussa Aktiengesellschaft. Method for preparation of alkali metal selenates. 4,536,383, Cl. 423-508.000.
Kaul, Martin: *See*—
Opprecht, Paul; Weil, Wolfgang; and Kaul, Martin, 4,536,636, Cl. 219-83.000.
Kautter, William J., Jr.: *See*—
Gard, Eric A.; Kautter, William J., Jr.; and Bartsch, Kenneth E., 4,535,854, Cl. 177-1.000.
Kavesh, Sheldon; and Prevorsek, Dusan C., to Allied Corporation. High tenacity, high modulus polyethylene and polypropylene fibers and intermediates therefore. 4,536,536, Cl. 524-462.000.
Kawai, Hisasi: *See*—
Yoshinaga, Toru; Igashira, Toshihiko; Kawai, Hisasi; Morino, Seiji; and Nakamura, Norihiko, 4,535,735, Cl. 123-310.000.
Kawai, Tohru: *See*—
Sumi, Akiyasu; and Kawai, Tohru, 4,536,057, Cl. 350-318.000.
Kawai, Yoshio: *See*—
Kida, Koichi; Kawai, Yoshio; Tamura, Yutaka; and Suzuki, Yoshiharu, 4,536,605, Cl. 585-640.000.
Kawamoto, Kinji; Tsukamoto, Masao; Murase, Kazuhiro; Kaneski, Tetsuhiko; and Nikaido, Masataka, to Matsushita Electric Industrial Co. Ltd. Multiple wave generator. 4,536,853, Cl. 364-718.000.
Kawamura Institute of Chemical Research: *See*—
Kamei, Masayuki; Endo, Tomio; and Hashimoto, Yutaka, 4,536,298, Cl. 252-8.050.
Kawanishi, Toshiyuki; and Tabata, Yukio, to Ricoh Company, Ltd. Electrothermic non-impact recording material. 4,536,437, Cl. 428-212.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Horiuchi, Hajimu; and Sakaguchi, Akira, 4,536,637, Cl. 219-117.100.
Kawasaki Kasei Chemicals Ltd.: *See*—
Komatsu, Tatsuyoshi; Numata, Shigeaki; Sumino, Toshihiko; Matsuzaki, Katsumi; Narita, Masao; and Hioki, Katsuhiko, 4,536,337, Cl. 260-396.00R.
Kawazoe, Yuzuru: *See*—
Kimijima, Norio; and Kawazoe, Yuzuru, 4,536,615, Cl. 179-81.00B.
Kay, Duncan A.: *See*—
Musto, Franklyn K.; Bourn, Hugh E.; Buchanan, John; and Kay, Duncan A., 4,535,477, Cl. 2-2.10R.
Kaye, Lawrence A.; and Mayer, Robert, to Giga-Tronics, Inc. Apparatus for rapidly switching a controlled signal source and method therefor. 4,536,722, Cl. 331-117.00D.
Kayser, Robert B.; and Purcell, Robert F., to Angus Chemical Company. Micellar solution for recovering crude oil. 4,536,300, Cl. 252-8.55D.
Kazuno, Yuzo: *See*—
Ito, Tatsuo; Oba, Kazunori; Fukuyasu, Harumi; Niwa, Tomizo; Shomura, Takashi; and Kazuno, Yuzo, 4,536,398, Cl. 514-43.000.
Kearney-National, Inc.: *See*—
Osborne, Anthony, 4,536,822, Cl. 361-340.000.
Kearney & Trecker Corporation: *See*—
Kielma, Ervin J., 4,536,111, Cl. 409-80.000.
Kedem, Abraham. Mixing device. 4,536,092, Cl. 366-265.000.
Keenan, Robert E., to A. H. Robins Company, Inc. Method of controlling emesis caused by cisplatin in cancer chemotherapy. 4,536,386, Cl. 424-10.000.
Keener, Everett L.: *See*—
Boggs, William E.; and Keener, Everett L., 4,536,194, Cl. 48-180.100.
Kelfve, Sten S.: *See*—
Hansen, Bertil V.; Kelfve, Sten S.; and Mollberg, Henri R., 4,536,187, Cl. 44-51.000.
Keller, Gordon: *See*—
Shah, Hemen V.; Mashikian, Victor; Seaton, John; and Keller, Gordon, 4,536,839, Cl. 364-200.000.
Keller Industries, Inc.: *See*—
Cornell, Howell N., 4,536,026, Cl. 297-39.000.
Keller, Paul: *See*—
Heiligman, Randy B.; and Keller, Paul, 4,535,918, Cl. 222-185.000.
Keller, Tony W.; and Muller, Wolfgang, to Bruker Analytische MeBtechnik GmbH. Cooling device for a low temperature magnet system. 4,535,595, Cl. 62-3.000.
Kells Medical, Incorporated: *See*—
Sheehan, Joseph C. M., 4,535,772, Cl. 128-337.000.
Kelly, Guy M.: *See*—
Roes, John B.; Kelly, Guy M.; Case, Robert F.; and Deming, Chandler R., 4,535,892, Cl. 209-3.300.
Kemmner, Ulrich: *See*—
Kubach, Hans; Kemmner, Ulrich; and Grimm, Gerold, 4,536,731, Cl. 335-272.000.
Kemotron A/S: *See*—
Bertelsen, Per M., 4,536,253, Cl. 162-30.110.
Kemper, Kyran B., to AT&T Bell Laboratories. Magnetic current sensor. 4,536,706, Cl. 324-117.00R.
Kenmochi, Hirohito: *See*—
Hashimoto, Kiyoyasu; Yoshinaga, Kenji; Mori, Yoshio; Seino, Junzaburo; Kenmochi, Hirohito; and Sato, Katsunobu, 4,536,569, Cl. 534-575.000.
Kenmostu, Isami; and Isobe, Nobuyuki, to Pioneer Electronic Corporation. Bookshelf type record player. 4,536,865, Cl. 369-75.200.
Kennard, Walter E.: *See*—
Terrones, Johnny; and Kennard, Walter E., 4,535,796, Cl. 137-45.000.
Kennecott Corporation: *See*—
Patarcity, Adam J., 4,536,018, Cl. 285-229.000.
Kennedy, Peter; and Parkinson, Kenneth, to United Kingdom Atomic Energy Authority. Reaction bonded silicon carbide artefacts. 4,536,449, Cl. 428-408.000.
Kenner, Erich: *See*—
Langen, Herbert; Reiser, Peter; and Kenner, Erich, 4,536,151, Cl. 431-1.000.
Kent Products, Inc.: *See*—
Dorr, William C.; Hybarger, Kenneth C.; and Yurkinas, James A., 4,535,973, Cl. 254-323.000.
Keptel, Inc.: *See*—
Perry, Steven B., 4,536,617, Cl. 179-81.00R.
Kerber, Heinz; and Kerber, Hella, to Kerber, Hella. Method and apparatus for the manufacture of wire link bands. 4,535,824, Cl. 140-111.000.
Kerber, Hella: *See*—
Kerber, Heinz; and Kerber, Hella, 4,535,824, Cl. 140-111.000.
Kerbl, Maximilian: *See*—
Singer, Robert; Goetze, Richard; Maier, Karl; and Kerbl, Maximilian, 4,536,534, Cl. 524-262.000.
Kerekess, Tibor T.: *See*—
Boutaleb, Lucy A.; Boutaleb, Aboubekr; and Kerekess, Tibor T., 4,536,014, Cl. 283-83.000.
Kerr, James F., to Material Control, Inc. Shock mount telescoping conveyor belt cleaner. 4,535,883, Cl. 198-499.000.
Ketterer, Stanley J., to Singer Company, The. Looper-cam shifting arrangement for a sewing machine. 4,535,711, Cl. 112-199.000.
Khandros, Igor Y.; and Larson, Hugo R., to Abex Corporation. Erosion and corrosion resistant cast iron alloy containing chromium, nickel and molybdenum. 4,536,232, Cl. 148-35.000.
Kida, Kenji, to Komori Printing. Gripper opening/closing apparatus of sheet-fed rotary press. 4,535,691, Cl. 101-230.000.
Kida, Koichi; Kawai, Yoshio; Tamura, Yutaka; and Suzuki, Yoshiharu, to Mitsubishi Gas Chemical Co., Inc. Process for the production of tertiary olefin. 4,536,605, Cl. 585-640.000.
Kielma, Ervin J., to Kearney & Trecker Corporation. Machine tool having numerically controlled adjustable arbor set up for straddle milling. 4,536,111, Cl. 409-80.000.
Kijima, Takao; Maebayashi, Jiro; and Ando, Fumitaka, to Mazda Motor Corporation. Vehicle rear suspension mechanism. 4,536,007, Cl. 280-701.000.
Kikkoman Corporation: *See*—
Furukawa, Toshio, 4,536,284, Cl. 209-305.000.
Killat, George R.; and Wilson, Larry R., to Dow Chemical Company, The. Polyamidoamine containing pendant ammonium moiety having crosslinking functionality. 4,536,552, Cl. 525-451.000.
Kim, Choung U.; and Micso, Peter F., Jr., to Bristol-Myers Company. Carbapenem antibiotics. 4,536,335, Cl. 260-245.20T.
Kim, Wan S.; Jeong, Seo Y.; and McRea, James C., to University of Utah. Amido-phenyl-α-D-glucopyranoside derivatives. 4,536,572, Cl. 536-179.000.
Kimball International, Inc.: *See*—
Henriott, Jay M.; and Hostetter, David L., 4,535,703, Cl. 108-50.000.

Kimberly-Clark Corporation: *See*—
Ruth-Larson, Dawn; and Nels, James S., 4,535,481, Cl. 2-114.000.
Kimijima, Norio; and Kawazoe, Yuzuru, to Nitsuko Limited. Key telephone equipment and associated method. 4,536,615, Cl. 179-81.00B.
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, to Asahi Kasei Kogyo Kabushiki Kaisha. Perfluoro vinyl ethers. 4,536,352, Cl. 260-543.00F.
King, James D.; and Riewerts, Erroll S., to Southwest Research Institute. Method and apparatus for measuring flow in a pipe or conduit. 4,536,711, Cl. 324-306.000.
Kinkori, Shuzo: *See*—
Kanayama, Kenji; and Kinkori, Shuzo, 4,536,672, Cl. 310-268.000.
Kinoshita, Kunio: *See*—
Kokaji, Norio; and Kinoshita, Kunio, 4,536,773, Cl. 346-74.200.
Kinoshita, Shigeji: *See*—
Denda, Masahiko; Sato, Shinichi; Tsubouchi, Natsuro; Kinoshita, Shigeji; and Ohbayashi, Yoshikazu, 4,535,530, Cl. 29-571.000.
Kioritz Corporation: *See*—
Nagashima, Akira, 4,535,910, Cl. 220-377.000.
Kiricoples, Charles P.; Behrens, Henry; and Brown, Robert L., to Gillette Company, The. Writing instrument with ball point and two reservoirs. 4,536,099, Cl. 401-209.000.
Kirkpatrick, Lloyd V.; and McGee, John R., to Kirkpatrick-McGee, Inc. Fluid flow measurement system. 4,535,851, Cl. 175-38.000.
Kirkpatrick-McGee, Inc.: *See*—
Kirkpatrick, Lloyd V.; and McGee, John R., 4,535,851, Cl. 175-38.000.
Kirstein, Fritz, to Agfa-Gevaert Aktiengesellschaft. Forgery-proof information carrier. 4,536,015, Cl. 283-91.000.
Kirton, Douglas C.; MacNeill, Avril B.; and Verhagen, Laurentius A. M., to Lever Brothers Company. Spread having butter-like properties. 4,536,411, Cl. 426-603.000.
Kishi, Yoshito, to Meiji Seika Kaisha, Ltd. New anthracyclinones and their production. 4,536,336, Cl. 260-351.100.
Kitagishi, Nozomu; Suzuki, Kenji; and Sakai, Shinji, to Canon Kabushiki Kaisha. Apparatus for detecting a condition of sharpest focus. 4,536,073, Cl. 354-406.000.
Kitamura, Yukinori: *See*—
Nagumo, Shuzo; Ogura, Setsuo; and Kitamura, Yukinori, 4,536,784, Cl. 357-48.000.
Kitko, David J.: *See*—
Hardy, Frederick E.; Kitko, David J.; and Cambre, Cushman M., 4,536,314, Cl. 252-102.000.
Kitrilakis, Sotiris; and Johnson, Theodore R., to Ancet Corporation. Method and apparatus for detecting blood gas. 4,535,778, Cl. 128-635.000.
Kiyomiya, Yutaka: *See*—
Sasaki, Yutaka; Kiyomiya, Yutaka; Nakamura, Toshio; Nakamura, Yoshimi; and Yamaguchi, Masanori, 4,536,483, Cl. 502-20.000.
Klaschka, John T., to Sodic Societe Anonyme. Fluidised beds. 4,535,706, Cl. 110-245.000.
Klawitter, Jerome J.; and Cromie, Harry W., to Hemex, Inc. Suture rings for heart valves. 4,535,483, Cl. 623-2.000.
Klawitter, Ronald R., to Handi-Pac, Inc. Toy computer busy box assembly. 4,536,164, Cl. 446-143.000.
Klein, Joseph T.: *See*—
Davis, Larry; and Klein, Joseph T., 4,536,578, Cl. 544-360.000.
Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Feldle, Gunter; and Fischer, Klaus, 4,536,128, Cl. 415-219.00C.
Klijanowicz, James E.; and Kovacs, Csaba A., to Eastman Kodak Company. Color-forming carboxamidonaphthalene dye precursor and carboximide dye in photographic material and process. 4,536,598, Cl. 564-49.000.
Klingensmith, G. Bruce; Whitehead, Richard O.; and Higgins, Thair L., to Shell Oil Company. Rubberless high impact polypropylene. 4,536,537, Cl. 524-481.000.
Klinger, Dieter: *See*—
Plath, Ernst-Dieter; and Klinger, Dieter, 4,535,608, Cl. 66-9.00R.
Klossman, Charles W.: *See*—
Willitts, Benjamin R.; and Klossman, Charles W., 4,535,603, Cl. 62-196.400.
Klubitschko, Gerd, to Marker International Company. Indicator for safety ski binding. 4,535,718, Cl. 116-212.000.
Knirsch, Franco; Gianolini, Giovanni; Dagna, Gian D.; and Buat, Mario, to Ing. C. Olivetti & C., S.p.A. Ink-jet printing device. 4,536,776, Cl. 346-140.00R.
Knoke, Gerald S.: *See*—
Huffman, Lester H.; and Knoke, Gerald S., 4,536,035, Cl. 299-17.000.
Knoll International, Inc.: *See*—
Davis, Charles S., 4,536,833, Cl. 362-293.000.
Latone, Thomas L., 4,536,031, Cl. 297-353.000.
Knorr-Bremse GmbH: *See*—
Eder, Herbert, 4,536,040, Cl. 303-37.000.
Pollinger, Hans; Saumweber, Eckart; Schorwerth, Mathias; and Wirth, Xaver, 4,535,874, Cl. 188-73.100.
Knox, Jack M.: *See*—
Hung, William M.; and Knox, Jack M., 4,536,368, Cl. 422-37.000.
Kobayashi, Michio, to Jidosha Kiki Co., Ltd. Reaction force mechanism for brake power servo booster. 4,535,591, Cl. 60-554.000.
Kobayashi, Toshio: *See*—
Kodama, Masayuki; and Kobayashi, Toshio, 4,535,650, Cl. 74-665.0GA.
Kobayashi, Toshirou: *See*—
Hayashi, Motoshige; Kobayashi, Toshirou; Yoshii, Motokazu; Tsubone, Masahiro; and Ishikawa, Mikio, 4,536,357, Cl. 264-53.000.
Kobler, Armin: *See*—
Kuhnis, Ernst; Kobler, Armin; Schreiber, Max; and Wallimann, Hans, 4,535,709, Cl. 112-83.000.
Kodaira, Takanori, to Canon Kabushiki Kaisha. Focal length changeable camera. 4,536,068, Cl. 354-195.120.
Kodama, Hisashi; Hamamoto, Tooru; Tamura, Tetsuomi; Sato, Katsujiro; and Yamada, Kazuharu, to Aisin Seiki Kabushiki Kaisha. Self-contained hydraulic lash adjuster. 4,535,734, Cl. 123-90.580.
Kodama, Masayuki; and Kobayashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Four-wheel driving apparatus with an automatic transmission. 4,535,650, Cl. 74-665.0GA.
Koe, B. Kenneth: *See*—
Welch, Willard M., Jr.; Harbert, Charles A.; Koe, B. Kenneth; and Kraska, Allen R., 4,536,518, Cl. 514-647.000.
Koehler, Richard F., Jr.: *See*—
Hauser, Oscar G.; Lysy, Dusan G.; and Koehler, Richard F., Jr., 4,536,080, Cl. 355-14.00D.
Kohler, Ramon C., to Caterpillar Tractor Co. Throttle linkage structure and method for its assembly and disassembly. 4,535,646, Cl. 74-501.00R.
Kohn, Gary A.: *See*—
Gano, John C.; and Kohn, Gary A., 4,535,968, Cl. 251-58.000.
Kohn, Henri-Armand, to Baltek Corp. Scrimless contourable core for use in laminated contoured structures. 4,536,427, Cl. 428-44.000.
Kojima, Tetsuhiko: *See*—
Sugimori, Shigeru; Kojima, Tetsuhiko; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,536,321, Cl. 252-299.630.
Kok, Paul, to International Business Machines Corporation. High power chip cooling device and method of manufacturing same. 4,535,841, Cl. 165-185.000.
Kokado, Hiroshi: *See*—
Nakatani, Kaname; Hanna, Junichi; and Kokado, Hiroshi, 4,536,461, Cl. 430-58.000.
Kokaji, Norio; and Kinoshita, Kunio, to Iwatsu Electric Co., Ltd. Magnetic recording apparatus with adjustable line density. 4,536,773, Cl. 346-74.200.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Yamaguchi, Hirohisa; Yamada, Kazuo; and Miyasato, Tsutomu, 4,536,745, Cl. 340-347.0DD.
Komarov, Jury Y.: *See*—
Kosolapov, Gennady M.; Revin, Alexandr A.; Komarov, Jury Y.; Umnyashkin, Vladimir A.; Kondrashkin, Alexandr S.; and Sobolev, Jury A., 4,536,041, Cl. 303-119.000.
Komatsu, Tatsuyoshi; Numata, Shigeaki; Sumino, Toshihiko; Matsuzaki, Katsumi; Narita, Masao; and Hioki, Katsuhiko, to Kawasaki Kasei Chemicals Ltd. Process for the preparation of quinones. 4,536,337, Cl. 260-396.00R.
Komatsubara, Masahiro: *See*—
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takugi, 4,536,811, Cl. 360-96.600.
Komori Printing: *See*—
Kida, Kenji, 4,535,691, Cl. 101-230.000.
Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Apparatus for applying molten wax onto printed circuit board. 4,535,722, Cl. 118-692.000.
Kondo, Mitsuru; Iwasaki, Hiroshi; Omura, Haruo; and Kanda, Nobuo, to Kanzaki Paper Manufacturing Co., Ltd. Fluoran derivatives as new compounds and recording system utilizing the same as colorless chromogenic material. 4,536,220, Cl. 106-21.000.
Kondrashkin, Alexandr S.: *See*—
Kosolapov, Gennady M.; Revin, Alexandr A.; Komarov, Jury Y.; Umnyashkin, Vladimir A.; Kondrashkin, Alexandr S.; and Sobolev, Jury A., 4,536,041, Cl. 303-119.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Motohashi, Mitsuo; Nemoto, Mitsugu; and Tamura, Akihiko, 4,536,082, Cl. 355-3.0SH.
Nishi, Shinichi; Satoh, Taxey; Shimada, Fumio; and Takahashi, Toshiaki, 4,536,471, Cl. 430-495.000.
Uehara, Masafumi; Yamazaki, Atsuo; and Shimura, Kazuhiro, 4,536,465, Cl. 430-192.000.
Kontron Holding A.G.: *See*—
Marangoni, Daniele, 4,535,783, Cl. 128-711.000.
Koppl, Franz: *See*—
Hamster, Helmut; and Koppl, Franz, 4,536,642, Cl. 219-374.000.
Kordomenos, Panagiotis I., to Ford Motor Company. Chain extended epoxy-ester polymeric compositions for cationic electrodeposition. 4,536,558, Cl. 528-100.000.
Korenberg, Jakob, to York-Shipley, Inc. High turndown ratio fluidized bed reactor and method of operating the reactor. 4,535,707, Cl. 110-245.000.
Korneev, Valentin I.: *See*—
Kaluzhsky, Nikolai A.; Badaliants, Khoren A.; Kostin, Ivan M.; Zatulovsky, Isaak A.; Korneev, Valentin I.; Andreev, Vladimir V.; Kuzmin, Boris A.; Sizyakov, Viktor M.; Shmorgunenko, Nikolai S.; Krochevsky, Vladislav A.; and Alexeev, Alexei I., 4,536,216, Cl. 106-38.300.
Kosaka, Yoshiteru: *See*—
Hirota, Akira; Miyahara, Hiroyuki; and Kosaka, Yoshiteru, 4,536,795, Cl. 358-160.000.
Kosolapov, Gennady M.; Revin, Alexandr A.; Komarov, Jury Y.; Umnyashkin, Vladimir A.; Kondrashkin, Alexandr S.; and Sobolev,

Jury A., to Znameni Politekhnichesky Institut. Anti-lock brake system of a motor vehicle. 4,536,041, Cl. 303-119.000.

Kostin, Ivan M.: *See*—
Kaluzhsky, Nikolai A.; Badaliants, Khoren A.; Kostin, Ivan M.; Zatulovsky, Isaak A.; Korneev, Valentin I.; Andreev, Vladimir V.; Kuzmin, Boris A.; Sizyakov, Viktor M.; Shmorgunenko, Nikolai S.; Krochevsky, Vladislav A.; and Alexeev, Alexei I., 4,536,216, Cl. 106-38.300.

Kostorz, Jan R.: *See*—
Pawelzik, Manfred; Herring, William P.; and Kostorz, Jan R., 4,535,814, Cl. 137-625.170.

Kouno, Kageaki: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,536,397, Cl. 514-11.000.

Kouno, Shuichiro: *See*—
Kubo, Yoshiaki; Takemura, Kaoru; and Kouno, Shuichiro, 4,536,206, Cl. 71-3.000.

Kovacs, Csaba A.: *See*—
Klijanowicz, James E.; and Kovacs, Csaba A., 4,536,598, Cl. 564-49.000.

Koyo Auto-Mech. Co., Ltd.: *See*—
Sano, Osamu, 4,535,798, Cl. 137-625.210.

Kozai, Yoshinori; Amemiya, Yoichi; and Asahara, Sunao, to Fanuc Ltd. Photoelectric converter-type pulse encoder. 4,536,649, Cl. 250-231.0SE.

Kramer, Daniel P., to United States of America, Energy. Pressurized heat treatment of glass-ceramic to control thermal expansion. 4,536,203, Cl. 65-29.000.

Kranz, Eckart; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Process for preparing α-ketonitriles. 4,536,353, Cl. 260-545.00R.

Krappitz, Heinz: *See*—
Grell, Karl-Heinz; and Krappitz, Heinz, 4,535,885, Cl. 198-695.000.

Kraska, Allen R.: *See*—
Welch, Willard M., Jr.; Harbert, Charles A.; Koe, B. Kenneth; and Kraska, Allen R., 4,536,518, Cl. 514-647.000.

Krasnov, Igor: *See*—
Boyadjieff, George I.; and Krasnov, Igor, 4,535,852, Cl. 175-170.000.

Krause Plow Corporation: *See*—
Pfenninger, Billy J.; and Stansel, F. Harrison, 4,535,848, Cl. 172-311.000.

Krause, Warren H.: *See*—
Eskamani, Abolghassem; and Krause, Warren H., 4,536,584, Cl. 549-429.000.

Krauss-Maffei AG: *See*—
Hultsch, Gunther, 4,536,288, Cl. 210-325.000.

Krecke, Edmond D. Process for the production of leather base material. 4,536,430, Cl. 428-151.000.

Krehan, Ingomar: *See*—
Sirrenberg, Wilhelm; Marhold, Albrecht; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, 4,536,587, Cl. 549-366.000.

Kriz, Miroslav; and Harris, Kenneth M., to Lucas Industries plc. Reciprocating plunger fuel injection pump. 4,535,641, Cl. 74-53.000.

Krochevsky, Vladislav A.: *See*—
Kaluzhsky, Nikolai A.; Badaliants, Khoren A.; Kostin, Ivan M.; Zatulovsky, Isaak A.; Korneev, Valentin I.; Andreev, Vladimir V.; Kuzmin, Boris A.; Sizyakov, Viktor M.; Shmorgunenko, Nikolai S.; Krochevsky, Vladislav A.; and Alexeev, Alexei I., 4,536,216, Cl. 106-38.300.

Kroger, Harry; Jillie, Don W.; and Smith, Lawrence N., to Sperry Corporation. Superconductive tunnel-junction device with enhanced characteristics and method of manufacture. 4,536,414, Cl. 427-38.000.

Kroger, Harry, to Sperry Corporation. Fabrication of superconductive tunneling junction resistors and short circuits by ion implantation. 4,536,781, Cl. 357-5.000.

Krohn, Ulrich: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,535,683, Cl. 92-224.000.

Kroninger, Paul M., Jr.: *See*—
Binder, Paul B.; and Kroninger, Paul M., Jr., 4,536,820, Cl. 361-283.000.

Krude, Werner, to Uni-Cardan Aktiengesellschaft. Wheel hub assembly for a motor vehicle. 4,536,038, Cl. 301-124.00R.

Kruger, Robert A.; and Bateman, Wayne, to Thomson-CSF Broadcast, Inc. Apparatus and method for fluoroscopic imaging of a body. 4,536,790, Cl. 358-111.000.

Krumwiede, John F.; Harrell, William C.; Hilliard, William G.; and Harris, James E., to PPG Industries, Inc. Method for controlling currents in glass melter. 4,536,205, Cl. 65-135.000.

Krupa, Jerry J.: *See*—
Urban, Warren J.; Barillo, Joseph; and Krupa, Jerry J., 4,536,338, Cl. 260-400.000.

Kruse, Richard M.; Moffett, David J.; Patel, Madhu C.; and Barnes, Ronald L., to NCR Corporation. Optical card read/write scanning system. 4,536,648, Cl. 235-454.000.

Krynicki, Witold. Chip assembly. 4,536,638, Cl. 219-121.0LC.

Kubach, Hans; Kemmner, Ulrich; and Grimm, Gerold, to Robert Bosch GmbH. Electric control motor. 4,536,731, Cl. 335-272.000.

Kubec, Frantisek: *See*—
Rohlicek, Vojtech; Hruby, Jaroslav; Nohavica, Dusan; Hrdlicka, Jan; Vykouk, Vlastimil; and Kubec, Frantisek, 4,535,784, Cl. 128-735.000.

Kubina, Stephen J.: *See*—
Atkinson, Gordon E.; and Kubina, Stephen J., 4,535,819, Cl. 137-846.000.

Kubo, Miyuki: *See*—
Shirai, Shiro; Ogahara, Shunji; and Kubo, Miyuki, 4,536,749, Cl. 340-525.000.

Kubo, Yoshiaki; Takemura, Kaoru; and Kouno, Shuichiro, to Wako Pure Chemical Industries, Ltd. Miticidal composition and method for controlling spider mites. 4,536,206, Cl. 71-3.000.

Kubota, Hiromitsu: *See*—
Kato, Hiroshi; and Kubota, Hiromitsu, 4,536,807, Cl. 360-72.300.

Kubota, Hitoshi; Tanaka, Minoru; and Aiuchi, Susumu, to Hitachi, Ltd. Method for forming tapered films. 4,536,419, Cl. 427-255.500.

Kubota, Ltd.: *See*—
Hasegawa, Shigekazu; Okita, Naoki; and Machida, Satoshi, 4,535,847, Cl. 172-2.000.

Kubota, Nobunori: *See*—
Nakahara, Teiji; Sakai, Shoji; Noda, Koshi; Fujiwara, Michiaki; and Kubota, Nobunori, 4,535,944, Cl. 242-35.50A.

Kubota, Tatsushi: *See*—
Matsunami, Muneharu; Tsuge, Hiroshi; Kubota, Tatsushi; and Ogawa, Hisashi, 4,536,010, Cl. 280-802.000.

Kudlacek, Donald S. Bowsight for compound archery bows. 4,535,747, Cl. 124-87.000.

Kudo, Ichiro; Kasai, Yoshiaki; and Yuasa, Masaharu, to Fuji Jukogyo Kabushiki Kaisha. System for preventing knocking in a combustion engine. 4,535,739, Cl. 123-425.000.

Kuehn, James: *See*—
Holzgang, Curtis R.; Leavitt, Mark K.; Doney, Alfred D.; and Kuehn, James, 4,536,755, Cl. 340-573.000.

Kuhn, Siegfried: *See*—
Horsky, Anton; Kuhn, Siegfried; and Voss, Wolf-Dietrich, 4,536,112, Cl. 409-134.000.

Kuhnis, Ernst; Kobler, Armin; Schreiber, Max; and Wallimann, Hans, to Aktiengesellschaft Adolph Saurer. Switchable braking mechanism, especially for the individual threads of an embroidery machine. 4,535,709, Cl. 112-83.000.

Kuiper, Johnny, to Foolish Fantasies B.V. Vehicle with tiltable side walls. 4,535,933, Cl. 237-12.30A.

Kulkarni, Chidambar L.: *See*—
Lim, Drahoslav; Kulkarni, Chidambar L.; and Repella, Dennis A., 4,536,554, Cl. 526-264.000.

Kume, Hiroshi; and Tan, Yoichi, to Fuji Xerox Co., Ltd. Retransmission control system. 4,536,875, Cl. 370-85.000.

Kumura, Haruyoshi: *See*—
Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,536,171, Cl. 474-28.000.

Kumura, Masao: *See*—
Hayakawa, Masao; Maeda, Takamichi; and Kumura, Masao, 4,536,786, Cl. 357-68.000.

Kunica, Serge, to Itek Corporation. Two rotary blade camera shutter. 4,536,069, Cl. 354-265.000.

Kunieda, Hirohiko, to Hinomaru Seni Co., Ltd. One-piece garment. 4,535,480, Cl. 2-079.000.

Kunz, Peter: *See*—
Heubach, Rainer; Marx, Reinhard; Kunz, Peter; and Hauke, Dieter, 4,536,385, Cl. 423-621.000.

Kurahashi, Yasuo: *See*—
Ohumi, Takeharu; Kurahashi, Yasuo; Hattori, Kyo; and Sakurai, Kazuhiro, 4,535,815, Cl. 137-625.480.

Kurashima, Hideo: *See*—
Imatani, Tsuneo; Yasumuro, Hisakazu; Watanabe, Michio; Kurashima, Hideo; and Ishibashi, Kazuhisa, 4,536,243, Cl. 156-274.600.

Kurata, Masami, to Fuji Xerox Co., Ltd. Facsimile apparatus 4,536,802, Cl. 358-287.000.

Kurihara, Norimitsu; Suzuki, Toshiyasu; Iwanaga, Takashi; and Hisadomi, Masaru, to Honda Giken Kogyo Kabushiki Kaisha. Mount for an earth magnetism sensor for use in an automotive vehicle. 4,535,547, Cl. 33-356.000.

Kurihara, Norimitsu; and Imai, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for controlling power window of vehicle. 4,536,687, Cl. 318-480.000.

Kuse, Takashi: *See*—
Nakamura, Masaru; and Kuse, Takashi, 4,535,681, Cl. 91-527.000.

Kusuhara, Masakazu: *See*—
Yamawaki, Takesi, deceased; Kusuhara, Masakazu; and Saitou, Tatuya, 4,536,025, Cl. 296-37.160.

Kuwabara, Kunikazu: *See*—
Ebihara, Shigeto; Ohta, Atsuo; and Kuwabara, Kunikazu, 4,536,750, Cl. 340-539.000.

Kuzmin, Boris A.: *See*—
Kaluzhsky, Nikolai A.; Badaliants, Khoren A.; Kostin, Ivan M.; Zatulovsky, Isaak A.; Korneev, Valentin I.; Andreev, Vladimir V.; Kuzmin, Boris A.; Sizyakov, Viktor M.; Shmorgunenko, Nikolai S.; Krochevsky, Vladislav A.; and Alexeev, Alexei I., 4,536,216, Cl. 106-38.300.

Kylmanen, Pasi; and Takalo, Pasi, to Saastamoinen Oy. Feeding means for feeding solid fuel from a storage silo or equivalent into a solid fuel heating boiler. 4,536,120, Cl. 414-173.000.

Kyoeizoki Co., Ltd.: *See*—
Hayashi, Takeshi, 4,535,942, Cl. 241-36.000.

Kytta, Oswald O., to Bendix Corporation, The. Control valve for a brake booster. 4,535,679, Cl. 91-376.00R.

La Telemecanique Electrique: *See—*
Belbel, Elie; Blanchard, Christian; Fechant, Louis; Haury, Andre ; and Lauraire, Michel, 4,536,630, Cl. 200-151.000.

Lachonius, Leif, to Aktiebolaget SKF. Holder for railings, lists and the like. 4,535,963, Cl. 248-251.000.

Lacombe, Jean-Loup; and Brun, Claude, to Atochem. Process for preparation of a transition metal component for a catalytic system of polymerization of olefins. 4,536,484, Cl. 502-62.000.

Lacour, Alain P.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Santamaria, Raphael, 4,536,500, Cl. 514-212.000.

Ladell, Michael G.: *See—*
Bickerstaff, Alan E.; Cotton, Austin H.; Ladell, Michael G.; and Neale, David M., 4,536,076, Cl. 355-3.0FU.

LaFave, Charles H. Belt sander. 4,535,568, Cl. 51-148.000.

Lahti, Mauritz J. B., to Telefonaktiebolaget LM Ericsson. Telecommunication system for transmitting data information by means of a digital exchange. 4,536,872, Cl. 370-82.000.

Laib, Roger D.: *See—*
Speca, Anthony N.; and Laib, Roger D., 4,536,489, Cl. 502-162.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,535,871, Cl. 182-93.000.

Lala, Louis A.; and Frenchy, James H., to American Screen Printing Equipment Company. Curing apparatus. 4,535,549, Cl. 34-4.000.

Lambregts, Antonius A., to Boeing Company, The. Total energy based flight control system. 4,536,843, Cl. 364-434.000.

Lan, Yung-Huei. Film-made pump driven by the filling effect of a fluid on filling into a chamber made of film. 4,536,136, Cl. 417-389.000.

Lancaster, Loren T., to AT&T Bell Laboratories. Integrated circuit contact technique. 4,535,532, Cl. 29-576.00B.

Landa, Vaclav; and Blazek, Zdenek, to Stani vyzkumny ustav materialu. Anisotropic permanent magnets. 4,536,230, Cl. 148-31.570.

Landis, Phillip S.: *See—*
Braid, Milton; and Landis, Phillip S., 4,536,192, Cl. 44-68.000.
Horodysky, Andrew G.; and Landis, Phillip S., 4,536,306, Cl. 252-32.70E.

Landstrom, Sven. Device for underwater missiles for use against submerged submarines. 4,535,696, Cl. 102-380.000.

Landsverk, James B. Support apparatus. 4,535,984, Cl. 272-78.000.

Lang, Stephen C.; and Gili, Paul E., to Sanders Associates, Inc. High-power pulse generator using transmission line with spark discharge device. 4,536,723, Cl. 331-127.000.

Lange , Francois; and Cornet, Jean, to Thomson-CSF. Protected optical disk with a free layer holder. 4,536,868, Cl. 369-284.000.

Langen, Herbert; Reiser, Peter; and Kenner, Erich, to J. Eberspacher. Mixture preparation for engine-independent heaters. 4,536,151, Cl. 431-1.000.

Lapeyre, James M., to Laitram Corporation, The. Unitary stairway. 4,535,871, Cl. 182-93.000.

Laplante, Gilbert, to Compagnie Francaise d'Enterprises Metalliques. Propulsive-force jack installation for producing the continuous movement of an oblong object in the direction of its axis, and/or for moving an element along said object. 4,535,971, Cl. 254-108.000.

Lapple, Arnulf R.; and Nicopoulos, Alex, to Ciba-Geigy Corporation. Liquid preparation of cationic dye mixture containing aliphatic carboxylic acid for black dyeing. 4,536,185, Cl. 8-527.000.

Larson, David A. Electro-acoustic transducer with diaphragm and blank therefor. 4,536,623, Cl. 179-115.00R.

Larson, Hugo R.: *See—*
Khandros, Igor Y.; and Larson, Hugo R., 4,536,232, Cl. 148-35.000.

Laskaris, Evangelos T., to General Electric Company. Plug for horizontal cryostat penetration. 4,535,596, Cl. 62-45.000.

Latham, Roger A., to Du Pont de Nemours, E. I., and Company. High impact resistant polyamide. 4,536,541, Cl. 525-66.000.

Latone, Thomas L., to Knoll International, Inc. Back support control mechanism for a chair or the like. 4,536,031, Cl. 297-353.000.

Laufer, Helmut; Pfeifle, Helmut; and Straubel, Max, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,535,742, Cl. 123-447.000.

Lauraire, Michel: *See—*
Belbel, Elie; Blanchard, Christian; Fechant, Louis; Haury, Andre ; and Lauraire, Michel, 4,536,630, Cl. 200-151.000.

Laurent, Henry: *See—*
Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, 4,536,401, Cl. 514-173.000.

Laurent, Michel, to Glaverbel. Glazing units. 4,536,424, Cl. 428-34.000.

Lawhorne, Earl R., to American Cyanamid Company. Process for the reduction of the viscosity of high solids pigment slurries. 4,536,268, Cl. 204-182.400.

Le, Tri C.: *See—*
Babbitt, Brett A.; Le, Tri C.; and Noble, Bruce P., 4,535,967, Cl. 251-54.000.

Leadvaro, Stephen J.: *See—*
English, George; and Leadvaro, Stephen J., 4,536,831, Cl. 362-263.000.

Leavitt, Mark K.: *See—*
Holzgang, Curtis R.; Leavitt, Mark K.; Doney, Alfred D.; and Kuehn, James, 4,536,755, Cl. 340-573.000.

LeBlanc, James C. Engine cooling system for vehicles. 4,535,862, Cl. 180-68.100.

LeBlanco Limited: *See—*
Hebert, Philip J.; and Blanchette, Leon G., 4,535,750, Cl. 126-41.00B.

Lechaton, John S.: *See—*
Bhatia, Harsaran S.; Dorler, Jack A.; Gaur, Santosh P.; Lechaton, John S.; Mosley, Joseph M.; and Srinivasan, Gurumakonda R., 4,535,531, Cl. 29-577.00C.

Leclercq, Joseph, to Commissariat a l'Energie Atomique; and Framatome. Fuel assemblies for nuclear reactors. 4,535,523, Cl. 29-402.080.

Lee, Shy-Fuh; and Henrick, Clive A., to Zoecon Corporation. Phenoxyphenylaminoalkylphosphinates useful in weed control. 4,536,355, Cl. 260-944.000.

Leech, Edward H. Valve system for vacuum sewage collection system. 4,535,800, Cl. 137-205.000.

Leete, Tom G., to Honeywell Inc. Data transmission system. 4,536,873, Cl. 370-85.000.

Leiblein, Felix: *See—*
Fischer, Wolfgang; and Leiblein, Felix, 4,536,511, Cl. 514-404.000.

Leifeld, Ferdinand; and Hosel, Fritz, to Trutzschler GmbH & Co. KG. Method and apparatus for controlling and regulating machines of a textile fiber processing line. 4,535,511, Cl. 19-105.000.

Lein, Joseph: *See—*
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,536,397, Cl. 514-11.000.

Lejeune, Jean-Pierre: *See—*
Romand-Monnier, Jacques; and Lejeune, Jean-Pierre, 4,536,138, Cl. 417-422.000.

Leland Stanford Junior University, The Board of Trustees of The: *See—*
Shaw, Herbert J.; and Bergh, Ralph A., 4,536,058, Cl. 350-320.000.

Lelu, Andre ; Gonthier, Bruno; Grignon, Jean; and Tauzia, Jean-Michel, to Societe Nationale Des Poudres et Explosifs. Combustion inhibitors on a base of oxygenated polyurethane elastomer which contains fibers for the double base propellant. 4,536,235, Cl. 149-19.400.

Lemburg, John R.: *See—*
Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., 4,536,791, Cl. 358-122.000.

Lemmon, Michael D.: *See—*
DiMassimo, Donald V.; May, John B.; and Lemmon, Michael D., 4,536,759, Cl. 340-706.000.

Lemole, Gerald M. Cardiovascular tourniquet. 4,535,770, Cl. 128-327.000.

Lemons, Thomas M., to Altman Stage Lighting Co., Inc. Replaceable light source assembly. 4,536,832, Cl. 362-264.000.

Lerner, Lawrence: *See—*
Ziegelheim, Irwin I.; and Lerner, Lawrence, 4,536,044, Cl. 312-257.00R.

Les Fils D'Auguste Scheuchzer S.A.: *See—*
Buhler, Fritz, 4,535,699, Cl. 104-7.00B.

L'Etat Francais: *See—*
Ramisse, Yves D.; Baboulet, Jean-Pierre C.; Vie, Michel P.; and Malaval, Paul C., 4,536,327, Cl. 252-511.000.

Lettau, Herbert: *See—*
Loth, Fritz; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,536,217, Cl. 106-122.000.

Lever Brothers Company: *See—*
Haq, Zia, 4,536,521, Cl. 521-146.000.
Kirton, Douglas C.; MacNeill, Avril B.; and Verhagen, Laurentius A. M., 4,536,411, Cl. 426-603.000.
Namnath, James S., 4,536,183, Cl. 8-107.000.
Urban, Warren J.; Barillo, Joseph; and Krupa, Jerry J., 4,536,338, Cl. 260-400.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Agricultural sulfonamides. 4,536,576, Cl. 544-321.000.

Levy, Alan A.: *See—*
White, Christopher D.; and Levy, Alan A., 4,536,389, Cl. 424-44.000.

Lewis, Charles J.: *See—*
Morehouse, Alpha L.; and Lewis, Charles J., 4,536,408, Cl. 426-250.000.

Lewis, James E.: *See—*
Hettinger, William P., Jr.; and Lewis, James E., 4,536,281, Cl. 208-113.000.

Lewis, Paul H., to Texaco Inc. Process for dewaxing with mordenite. 4,536,486, Cl. 502-74.000.

Leyerle, Richard W.: *See—*
Welsh, Lawrence B.; and Leyerle, Richard W., 4,536,358, Cl. 264-81.000.

Li, Ching C. Carburetor. 4,536,356, Cl. 261-50.00R.

Li, Hung J.; and Husak, Leonid, to Westinghouse Electric Corp. Protective relay apparatus and method for providing single-pole tripping. 4,536,815, Cl. 361-47.000.

Librecht, Freddy M.: *See—*
De Schamphelaere, Lucien A.; De Cock, Etienne M.; De Bondt, Werner E.; Librecht, Freddy M.; Boeve, Gerard J.; and Van Peteghem, Willy F., 4,536,778, Cl. 346-160.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Hubler, Bodo-Hagen, 4,536,725, Cl. 333-204.000.
Rembold, Bernhard; and Solbach, Klaus, 4,536,767, Cl. 343-785.000.

Lichstein, Bernard; and Handler, Michael, to International Playtex, Inc. Tampon applicator. 4,536,178, Cl. 604-15.000.

Lieber, Ludwig: *See—*
Macherle, Gunter; and Lieber, Ludwig, 4,535,916, Cl. 222-113.000.

Lim, Drahoslav; Kulkarni, Chidambar L.; and Repella, Dennis A., to Barnes-Hind, Inc. Hydrophilic polymers and contact lenses made therefrom. 4,536,554, Cl. 526-264.000.

Lin, Jiang-Jen; and Alexander, David C., to Texaco Inc. Butadiene reductive dimerization using a platinum catalyst and polymeric amine promoter. 4,536,604, Cl. 585-601.000.

Lin, Ming-Hsin. Discharging protection device for battery-operated portable electric light. 4,536,695, Cl. 320-2.000.

Lin, Samuel O. S.: *See*—
Fabrizio, Louis F.; Lin, Samuel O. S.; and Jacobine, Anthony F., 4,536,265, Cl. 204-159.130.

Lindabury, Tryon S., Sr. Fluid tight joint and system of distributing fluids. 4,535,938, Cl. 239-269.000.

Lindahl, Gertrud M., to Boliden Aktiebolag. Stable solutions of basic aluminium sulphate containing polynucleate aluminium hydroxide sulphate complexes. 4,536,384, Cl. 423-556.000.

Linde, Lars H.: *See*—
Berglund, Lars G.; Bjorklund, Sven-Erik B.; and Linde, Lars H., 4,536,043, Cl. 312-222.000.

Lindemann, Rolf, to Hauni-Werke Korber & Co. KG. Apparatus for treating perforated webs of tipping paper or the like. 4,535,792, Cl. 131-281.000.

Linder, Kurt, to Mauser-Werke Oberndorf GmbH. Dynamic feeler head. 4,535,543, Cl. 33-169.00R.

Lindsay, Paul H., to General Electric Company. Quick attach-detach mechanism for audio components. 4,535,870, Cl. 181-141.000.

Lindskog, Kjell J. Manufacture of two part mold. 4,536,364, Cl. 264-227.000.

Link 51 Limited: *See*—
Jones, Harold; and Bell, David J., 4,535,898, Cl. 211-153.000.

Lion Corporation: *See*—
Fujiwara, Masami; Fukuda, Hidenori; and Tanaka, Minako, 4,536,324, Cl. 252-311.000.

Lippolis, Craig S.; and Nguyen, Tuan A., to Xerox Corporation. Servicing system for reproduction machines. 4,536,079, Cl. 355-14.00R.

Lisnyansky, Khaim, to International Paper Company. Method and apparatus for roll winding measurement. 4,535,950, Cl. 242-66.000.

Little, Victor, Jr.; and Thomas, Charles L., to ASARCO Incorporated. High-velocity gas burners. 4,536,152, Cl. 431-159.000.

Litton Systems, Inc.: *See*—
Price, Michael G.; Zehl, Otis G.; and Bonney, Robert D., 4,536,062, Cl. 350-358.000.

Liu, Bao-Horng: *See*—
Liu, Bao-Shen; and Liu, Bao-Horng, 4,535,542, Cl. 33-148.00E.

Liu, Bao-Shen; and Liu, Bao-Horng. Vernier gauge. 4,535,542, Cl. 33-148.00E.

Liu, Ping Y., to General Electric Company. Impact modified polycarbonate composition. 4,536,538, Cl. 524-508.000.

Livingston, William D.; and Jacob, Eugene E., to E-Systems, Inc. Tack-on acknowledgment in computer networks. 4,536,877, Cl. 370-94.000.

Llenado, Ramon A.; Mao, Mark H. K.; and Nicholson, Denzel A., to Procter & Gamble Company, The. Foaming surfactant compositions. 4,536,317, Cl. 252-174.170.

Llenado, Ramon A.: *See*—
Cook, Thomas E.; and Llenado, Ramon A., 4,536,318, Cl. 252-174.170.

Lo, Charng-Wen M.: *See*—
Sullivan, Lawrence B.; and Lo, Charng-Wen M., 4,536,862, Cl. 367-153.000.

Loblich, Karl-Richard, to Kali und Salz AG. Method of producing potassium magnesium phosphate. 4,536,376, Cl. 423-306.000.

Locacius, Robert F., to Felt Products Mfg. Co. Gasket assembly having a sealing member suspended in a clear-through opening and method of making same. 4,535,999, Cl. 277-235.00B.

Lochhead, Robert Y., Jr.: *See*—
George, Thomas R., Jr.; and Lochhead, Robert Y., Jr., 4,536,528, Cl. 524-313.000.

Loctite Corporation: *See*—
Fabrizio, Louis F.; Lin, Samuel O. S.; and Jacobine, Anthony F., 4,536,265, Cl. 204-159.130.

Loehrer, Fritz: *See*—
Blanc, Guy-Francois; and Loehrer, Fritz, 4,535,569, Cl. 51-165.900.

Loftin, Royal E.; and Son, Adelina J., to Halliburton Company. Well drilling and completion fluid composition. 4,536,297, Cl. 252-8.50C.

Logothetis, Eleftherios M.; and Kaiser, William J., to Ford Motor Company. Method of making a titanium dioxide oxygen sensor element with fast transient response. 4,536,241, Cl. 156-89.000.

London Fog, Inc.: *See*—
Tenney, William L., 4,536,132, Cl. 417-237.000.

Longacre, Andrew, Jr., to Welch Allyn Inc. Signal level control for video system. 4,535,758, Cl. 128-6.000.

Losert, Wolfgang: *See*—
Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, 4,536,401, Cl. 514-173.000.

Loth, Fritz; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, to Ceskoslovenska akademie ved of Praha; and Akademie der Wissenschaften der DDR. Absorbing cover for wounds and the method for manufacturing thereof. 4,536,217, Cl. 106-122.000.

Loughlin, Bernard D., to Hazeltine Corporation. Distortion correcting AM stereo receiver with non-flat AGC. 4,536,885, Cl. 381-15.000.

Louth, Kenneth, to Ampex Corporation. Microprocessor controlled multiple servo system for a recording and/or reproducing apparatus. 4,536,806, Cl. 360-69.000.

Lovin, Arthur. Sand trap practice device. 4,535,989, Cl. 273-176.0FB.

LTV Aerospace and Defense Company: *See*—
Marek, Albert J., 4,536,693, Cl. 320-1.000.

Lubowitz, Hyman R.; and Sheppard, Clyde H., to Boeing Company, The. Thermally stable polyimide polysulfone compositions for composite structures. 4,536,559, Cl. 528-170.000.

Lucas Industries plc: *See*—
Kriz, Miroslav; and Harris, Kenneth M., 4,535,641, Cl. 74-53.000.

Lucas Industries, Public Limited Company: *See*—
Ingram, Brian; and England, Michael J., 4,535,875, Cl. 188-106.00F.
Skinner, Robert T. J., 4,535,939, Cl. 239-533.300.

Luccarelli, Domenick, Jr.: *See*—
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,536,299, Cl. 252-8.600.

Ludington, Charlotte E., to United States of America, Air Force. Hybrid Schottky infrared focal plane array. 4,536,658, Cl. 250-578.000.

Ludwig Boschert GmbH & Co., KG: *See*—
Fazis, Harald, 4,535,665, Cl. 83-556.000.

Luetzelschwab, Wayne E., to Marathon Oil Company. Method of using polymer flow control apparatus. 4,535,844, Cl. 166-252.000.

Luke, John A., to Brown & Williamson Tobacco Corporation. Smoking article filters. 4,535,793, Cl. 131-336.000.

Lundberg, Robert D.; Peiffer, Dennis G.; and Duvdevani, Ilan, to Exxon Research and Engineering Co. Dilatant behavior of interpolymer complexes in aqueous solution. 4,536,539, Cl. 524-521.000.

Lundberg, Robert D.; and Phillips, Robert R., to Exxon Research and Engineering Co. Polymer complexes of a neutralized ionic polymer and a polycaprolactone polymer. 4,536,547, Cl. 525-186.000.

Lundberg, Robert D.: *See*—
Agarwal, Pawan K.; Lundberg, Robert D.; Graessley, William W.; and Ver Strate, Gay, 4,536,310, Cl. 252-33.000.

Luoma, Van A.: *See*—
Stromberg, Paul C.; and Luoma, Van A., 4,535,671, Cl. 84-422.00S.

Luscher, Rene , to Gretag Aktiengesellschaft. Process and apparatus for the production of photographic prints from disk shaped masters. 4,536,083, Cl. 355-40.000.

Lutzmann, H. Harald: *See*—
Miller, Gerald W.; and Lutzmann, H. Harald, 4,536,532, Cl. 524-141.000.

Lyle, Stephen V., to T.A.D. Avanti, Inc. Telephone answering machine interface circuit. 4,536,624, Cl. 179-170.0NC.

Lyle, W. D., Jr., to Mobil Oil Corporation. Method of increasing the vertical resolution of well log data. 4,535,625, Cl. 73-152.000.

Lynn, Homer S. Method and apparatus for gathering beverage straws and the like. 4,535,662, Cl. 83-23.000.

Lyon, Richard F., to Fairchild Camera and Instrument Corporation. Method and apparatus for simulating aural response information. 4,536,844, Cl. 364-487.000.

Lyons, Christopher S.: *See*—
Anderson, Michael H.; Lyons, Christopher S.; and Wigness, Bruce D., 4,536,179, Cl. 604-266.000.

Lysy, Dusan G.: *See*—
Hauser, Oscar G.; Lysy, Dusan G.; and Koehler, Richard F., Jr., 4,536,080, Cl. 355-14.00D.

M.A.N. Maschinenfabrik: *See*—
Suppan, Anton, 4,535,884, Cl. 198-626.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Schubert, Johannes, 4,535,692, Cl. 101-337.000.

M. Lehmacher & Sohn GmbH Maschinenfabrik: *See*—
Dreckmann, Karl, 4,536,174, Cl. 493-194.000.

M.P. United Drug Company Limited: *See*—
Holt, Andrew; and White, David W., 4,536,375, Cl. 423-247.000.

M&T Chemicals Inc.: *See*—
Guthrie, Roger T., 4,536,140, Cl. 417-500.000.

Ma, Thomas T., to Ford Motor Company. Engine control systems. 4,535,738, Cl. 123-425.000.

Ma, Thomas T., to Ford Motor Company. Engine control system. 4,535,740, Cl. 123-435.000.

Maag Gear-Wheel and Machine Company: *See*—
Blanc, Guy-Francois; and Loehrer, Fritz, 4,535,569, Cl. 51-165.900.

Maag Gear-Wheel & Machine Company Limited: *See*—
Mesey, Milton; Shcwaighofer, Roman; and Donner, Meinrad, 4,535,573, Cl. 51-165.870.

Maar, Lienhard, to Max Zapf, Firma. Batheable doll. 4,536,165, Cl. 446-153.000.

Mabuchi, Sadaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Transformer winding sheet insulator with spacer member. 4,536,734, Cl. 336-196.000.

MacAfee, Jerry D., to Quamco, Inc. Top entry ball valve. 4,535,970, Cl. 251-315.000.

MacAvoy, David W.: *See*—
Schildkraut, Alan L.; and MacAvoy, David W., 4,536,048, Cl. 339-89.00M.

Macherle, Gunter; and Lieber, Ludwig, to Fritz Eichenauer. Glue gun. 4,535,916, Cl. 222-113.000.

Machida, Satoshi: *See*—
Hasegawa, Shigekazu; Okita, Naoki; and Machida, Satoshi, 4,535,847, Cl. 172-2.000.

Mackinnon, John W. M.: *See—*
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; Mackinnon, John W. M.; Judd, Duncan B.; and Hayes, Roger, 4,536,508, Cl. 514-383.000.

MacLean-Fogg Company: *See—*
Murray, Pierre C., 4,536,116, Cl. 411-82.000.

MacNeill, Avril B.: *See—*
Kirton, Douglas C.; MacNeill, Avril B.; and Verhagen, Laurentius A. M., 4,536,411, Cl. 426-603.000.

Maebayashi, Jiro: *See—*
Kijima, Takao; Maebayashi, Jiro; and Ando, Fumitaka, 4,536,007, Cl. 280-701.000.

Maeda, Keikichi; Iijima, Takahiro; and Sato, Eiichi, to JGC Corporation; and Taihei Kinzoku Kogyo Co., Ltd. Centrifugally cast double-layer tube with resistance to carbon deposition. 4,536,455, Cl. 428-629.000.

Maeda, Masaya, to Canon Kabushiki Kaisha. Image signal recording-reproducing device. 4,536,805, Cl. 360-14.100.

Maeda, Takamichi: *See—*
Hayakawa, Masao; Maeda, Takamichi; and Kumura, Masao, 4,536,786, Cl. 357-68.000.

Maekawa, Yukio; Metabi, Tsuneyo; and Niwa, Masatake. Mount arrangement and interchangeable lens unit for photographic camera. 4,536,071, Cl. 354-400.000.

Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, to Kasei Optonix, Ltd. Radiographic image conversion screens. 4,536,436, Cl. 428-212.000.

Magnetic Peripherals: *See—*
Johnson, Robert A., 4,536,270, Cl. 204-192.00R.
Vinding, Jorgen P., 4,536,740, Cl. 340-347.0DD.

Magnotta, Frank A., to Dennison Manufacturing Co. Heat transfer laminate. 4,536,434, Cl. 428-200.000.

MAI Basic Four, Inc.: *See—*
Shah, Hemen V.; Mashikian, Victor; Seaton, John; and Keller, Gordon, 4,536,839, Cl. 364-200.000.

Maier, Karl: *See—*
Singer, Robert; Goetze, Richard; Maier, Karl; and Kerbl, Maximilian, 4,536,534, Cl. 524-262.000.

Maizenberg, Leonid I., to Sybron Corporation. Lever actuated chuck mechanism for dental handpiece. 4,536,157, Cl. 433-129.000.

Makalsky, Leonid M.: *See—*
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.

Maki, Farrel M., to Minnesota Mining and Manufacturing Company. Temperature compensated time exposure control circuit. 4,536,681, Cl. 315-309.000.

Makimoto, Mitsuo: *See—*
Hasegawa, Makoto; Makimoto, Mitsuo; Yamashita, Sadahiko; and Katayama, Yoshio, 4,536,724, Cl. 331-177.00V.

Malaval, Paul C.: *See—*
Ramisse, Yves D.; Baboulet, Jean-Pierre C.; Vie, Michel P.; and Malaval, Paul C., 4,536,327, Cl. 252-511.000.

Malivoir, Roger; and Mayer, Gilbert, to Pont-a-Mousson S.A. Method and apparatus for arranging cast-iron pipes in odd number stacks. 4,535,882, Cl. 198-425.000.

Malloy, Thomas P.; and Swedo, Raymond J., to UOP Inc. Enhanced oil recovery. 4,536,301, Cl. 252-8.55D.

Malone, Bradley P.: *See—*
Settineri, William J.; Charles, John G.; Hinkel, Jerald J.; and Malone, Bradley P., 4,536,222, Cl. 134-5.000.

Manabe, Sugio: *See—*
Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, 4,536,369, Cl. 422-65.000.

Mani, Krishnamurthy N.: *See—*
Chlanda, Frederick P.; and Mani, Krishnamurthy N., 4,536,269, Cl. 204-182.400.

Manke, James E. Automobile beverage holding device. 4,535,923, Cl. 224-273.000.

Mann, Kenneth G.: *See—*
Giles, Alan R.; and Mann, Kenneth G., 4,536,392, Cl. 424-101.000.

Manthei, Philip J.: *See—*
Fey, Robert M.; Woehler, Harold L.; and Manthei, Philip J., 4,535,610, Cl. 68-3.00R.

Mao, Mark H. K.: *See—*
Llenado, Ramon A.; Mao, Mark H. K.; and Nicholson, Denzel A., 4,536,317, Cl. 252-174.170.

Marangoni, Daniele, to Kontron Holding A.G. Personal electrocardiology recorder. 4,535,783, Cl. 128-711.000.

Marathon Oil Company: *See—*
Luetzelschwab, Wayne E., 4,535,844, Cl. 166-252.000.

Marconi Instruments Limited: *See—*
Smith, John L.; and Jenner, Frank H., 4,536,051, Cl. 339-117.00P.

Marconi, Walter. Cardiac valvular prosthesis of mechanical type provided with two freely moving leaflets. 4,535,484, Cl. 623-2.000.

Marcoux, Bernard; and Bridon, Jean-Noel, to Rhone-Poulenc Agrochimie. Insecticidal and acaricidal combination containing a pyrethroid. 4,536,506, Cl. 514-342.000.

Marek, Albert J., to LTV Aerospace and Defense Company. High-speed capacitor discharge circuit suitable for the protection of detonation devices. 4,536,693, Cl. 320-1.000.

Marhold, Albrecht: *See—*
Sirrenberg, Wilhelm; Marhold, Albrecht; Hammann, Ingeborg; Krehan, Ingomar; and Stendel, Wilhelm, 4,536,587, Cl. 549-366.000.

Marin Tek, Inc.: *See—*
Missimer, Dale J.; and St. Pierre, Michael R., 4,535,597, Cl. 62-55.500.

Maringer, Melvin F.: *See—*
Barlow, Anthony; and Maringer, Melvin F., 4,536,530, Cl. 524-109.000.

Marker International Company: *See—*
Klubitschko, Gerd, 4,535,718, Cl. 116-212.000.

Markle, Richard A., to Eagle-Picher Industries, Inc. Heat curable solventless liquid prepolymer and novel monomer prepared from N-(2-hydroxyalkyl)phthalimide. 4,536,582, Cl. 548-477.000.

Maros, Ronald R., to Cooper Industries, Inc. Connector assembly having grounding strap. 4,536,053, Cl. 339-143.00R.

Martel, Jacques; Tessier, Jean; and Teche, Andre , to Roussel Uclaf. Imino derivatives α-cyano-3-phenoxybenzyl 2,2-dimethyl-3-formyl-cyclopropane-1-carboxylate. 4,536,345, Cl. 260-465.00D.

Martens, Theodorus H. G.; and Sanders, Franciscus H. M., to U.S. Philips Corporation. Method of manufacturing an optically readable information disc. 4,536,415, Cl. 427-40.000.

Martin, David R.: *See—*
Orlando, Salvatore; and Martin, David R., 4,536,130, Cl. 417-63.000.

Martin, Robert C., to Texas Instruments Incorporated. A high speed, non-inverting circuit for providing an interface between TTL logic gates and Schottky transistor logic gates. 4,536,664, Cl. 307-475.000.

Martin-Smith, Michael: *See—*
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; Mackinnon, John W. M.; Judd, Duncan B.; and Hayes, Roger, 4,536,508, Cl. 514-383.000.

Martin, William A.: *See—*
Herman, George R.; and Martin, William A., 4,536,125, Cl. 415-5.000.

Marty, Urs. Articulator. 4,536,161, Cl. 434-264.000.

Maruyama, Ichiyo: *See—*
Shigemitsu, Mineo; Maruyama, Ichiyo; and Niimura, Shigeru, 4,536,751, Cl. 340-545.000.

Maruyama, Jisaburou; Fukayama, Sumio; Miyake, Masanobu; Watanabe, Yoshimi; and Eguchi, Yoshinori, to Tokyo Shibaura Denki Kabushiki Kaisha. Lamp assembly. 4,536,676, Cl. 313-318.000.

Maruyama, Teruo, to Matsushita Electric Industrial Co., Ltd. Rotary vane compressor with suction passage changing in two steps. 4,536,141, Cl. 418-150.000.

Marx, Reinhard: *See—*
Heubach, Rainer; Marx, Reinhard; Kunz, Peter; and Hauke, Dieter, 4,536,385, Cl. 423-621.000.

Maschinenfabrik Benninger AG: *See—*
Wildi, Edwin; Bossart, Erwin; and Hasler, Hans, 4,535,956, Cl. 242-151.000.

Maschinenfabrik Rieter AG: *See—*
Egbers, Gerhard; and Weinsdorfer, Helmut, 4,535,516, Cl. 28-272.000.

Mashikian, Victor: *See—*
Shah, Hemen V.; Mashikian, Victor; Seaton, John; and Keller, Gordon, 4,536,839, Cl. 364-200.000.

Mask, Ernest D. Power hip, hack squat and leg exercise sled. 4,535,985, Cl. 272-134.000.

Massey, Becky L. Self adhesive nail overlay or wrap. 4,536,426, Cl. 428-42.000.

Mastromatteo, Frank J. T-top lock-handle. 4,535,613, Cl. 70-221.000.

Masuda, Jiro: *See—*
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,535,864, Cl. 180-177.000.
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,535,865, Cl. 180-177.000.

Masuda, Masao, to Kabushiki Kaisha Masuda Seisakusho. Treating textile material with non woven fabric rolls. 4,535,611, Cl. 68-202.000.

Masuda, Sinichi, to Sharp Kabushiki Kaisha. Reset pulse generator. 4,536,667, Cl. 307-592.000.

Masuda, Takanori; Kakei, Tsutomu; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, to Fuji Photo Film Co., Ltd.; and Nippon Light Metal Company, Ltd. Method for electrolytic treatment. 4,536,264, Cl. 204-129.430.

Masuko, Fujio; and Katsura, Tadashi, to Sumitomo Chemical Company, Limited. Synthesis of amine derivatives. 4,536,599, Cl. 564-124.000.

Material Control, Inc.: *See—*
Kerr, James F., 4,535,883, Cl. 198-499.000.

Mather, Joseph M.; and Albright, Larry E., to Clark Equipment Company. Transverse engine mounting. 4,535,868, Cl. 180-297.000.

Matsubara, Soichi; Morita, Hirobumi; and Watanabe, Shinpei, to Honda Giken Kogyo Kabushiki Kaisha. Workpiece preset jig arrangement in a welding apparatus. 4,535,927, Cl. 228-6.100.

Matsuda, Hiroto: *See—*
Ikeda, Masami; Matsuda, Hiroto; Shibata, Makoto; and Takahashi, Hiroto, 4,536,250, Cl. 156-651.000.

Matsuda, Shunsuke: *See—*
Ito, Akio; Matsuda, Shunsuke; Murakami, Yoshinobu; and Tamura, Tooru, 4,536,267, Cl. 204-159.230.

Matsumoto, Haruyuki, to Canon Kabushiki Kaisha. Liquid jet recording apparatus. 4,536,777, Cl. 346-140.0PD.

Matsumoto, Tetsuo: *See*—
Yasui, Toshihiko; Matsumoto, Tetsuo; and Akaike, Akihiko, 4,536,468, Cl. 430-296.000.
Matsumura, Haruki: *See*—
Sunagawa, Makoto; Matsumura, Haruki; Inoue, Takaaki; and Hirohashi, Toshiyuki, 4,536,334, Cl. 260-239.00A.
Matsumura, Ryouichi, to Nissan Motor Company, Limited. Fuel cut-supply control system for multiple-cylinder internal combustion engine. 4,535,744, Cl. 123-493.000.
Matsumura, Susumu; Yano, Masao; Sashida, Nobuo; and Yamamoto, Yoshihiko, to Susumu Jatsumura; and Mitsubishi Denki Kabushiki Kaisha. Thyristor apparatus employing light-triggered thyristors. 4,536,816, Cl. 361-91.000.
Matsunami, Muneharu; Tsuge, Hiroshi; Kubota, Tatsushi; and Ogawa, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Automatic seatbelt system. 4,536,010, Cl. 280-802.000.
Matsushita Electric Industrial Company Limited: *See*—
Hasegawa, Makoto; Makimoto, Mitsuo; Yamashita, Sadahiko; and Katayama, Yoshio, 4,536,724, Cl. 331-177.00V.
Ishii, Takahito; Yamashita, Kazuo; and Uno, Hiroshi, 4,535,837, Cl. 165-104.170.
Ito, Akio; Matsuda, Shunsuke; Murakami, Yoshinobu; and Tamura, Tooru, 4,536,267, Cl. 204-159.230.
Kawamoto, Kinji; Tsukamoto, Masao; Murase, Kazuhiro; Kaneaki, Tetsuhiko; and Nikaido, Masataka, 4,536,853, Cl. 364-718.000.
Maruyama, Teruo, 4,536,141, Cl. 418-150.000.
Matsushita Electric Works, Ltd.: *See*—
Hideo, Hisamoto, 4,536,726, Cl. 335-23.000.
Ikeda, Shigayuki; and Hamabe, Takafumi, 4,535,760, Cl. 128-33.000.
Matsuura, Hiroyuki: *See*—
Iwaoka, Hideto; Fujino, Kenji; Sugiyama, Tadashi; and Matsuura, Hiroyuki, 4,536,712, Cl. 324-309.000.
Matsuura, Masaaki: *See*—
Nakano, Yoshikatsu; and Matsuura, Masaaki, 4,535,732, Cl. 123-90.160.
Matsuzaki, Katsumi: *See*—
Komatsu, Tatsuyoshi; Numata, Shigeaki; Sumino, Toshihiko; Matsuzaki, Katsumi; Narita, Masao; and Hioki, Katsuhiko, 4,536,337, Cl. 260-396.00R.
Matsuzawa, Toshiharu; Douta, Kikuo; Iwayanagi, Takao; and Yanazawa, Hiroshi, to Hitachi, Ltd. Method of forming a microscopic pattern. 4,536,421, Cl. 427-282.000.
Mattel, Inc.: *See*—
Ace, Marshall E., Jr., deceased; Mattson, Ray W.; and Wittenberg, Mark S., 4,536,162, Cl. 446-102.000.
Fekete, Ferenc; and Spears, James E., 4,536,169, Cl. 446-461.000.
Renger, Larry H.; and McKittrick, Mike T., 4,536,166, Cl. 446-298.000.
Stephens, William F., 4,536,168, Cl. 446-444.000.
Matthews, Leslie N. Variable air cushion mode vehicle. 4,535,712, Cl. 114-61.000.
Mattson, Ray W.: *See*—
Ace, Marshall E., Jr., deceased; Mattson, Ray W.; and Wittenberg, Mark S., 4,536,162, Cl. 446-102.000.
Maturo, Robert J.; Chin, Danny; and Henderson, John G. N., to RCA Corporation. Television receiver with auxiliary on-screen display. 4,536,797, Cl. 358-192.100.
Matz, Gary F., to Calgon Corporation. Carboxylic/sulfonic/quaternary ammonium polymers for use as scale and corrosion inhibitors. 4,536,292. Cl. 210-701.000.
Matzner, Markus; and Papuga, Donald M., to Union Carbide Corporation. Copolymers of polyphenylene oxides and poly(aryl ether)s. 4,536,543, Cl. 525-68.000.
Matzner, Markus; and Papuga, Donald M., to Union Carbide Corporation. Blends containing copolymers of polyphenylene oxides and poly(aryl ether)s. 4,536,544, Cl. 525-68.000.
Maurer, Dieter; Rauter, Jurgen; and Dziuba, Peter, to Zahnradfabrik Friedrichshafen AG. Pivot limiter for steered wheels. 4,536,003, Cl. 280-95.00R.
Maurer, Fritz, to Bayer Aktiengesellschaft. Preparation of 2-alkylthiomethyl-4-hydroxypyrimidines. 4,536,574, Cl. 544-253.000.
Mauri, Luigi; and Cardaio, Rino, to Moplefan S.p.A. Coated polyolefinic films having low adhesion to the welding bars. 4,536,453, Cl. 428-484.000.
Maurmann Ingenieurburo GmbH: *See*—
Reuter, Rolf, 4,535,685, Cl. 98-40.120.
Mauser-Werke Oberndorf GmbH: *See*—
Linder, Kurt, 4,535,543, Cl. 33-169.00R.
Max Zapf, Firma: *See*—
Maar, Lienhard, 4,536,165, Cl. 446-153.000.
May, John B.: *See*—
DiMassimo, Donald V.; May, John B.; and Lemmon, Michael D., 4,536,759, Cl. 340-706.000.
Maya, Jakob: *See*—
Bouchard, Andre C.; Maya, Jakob; and Sentementes, Thomas, 4,536,678, Cl. 313-493.000.
Mayekar, Kishor D.: *See*—
Amstutz, Gary A.; and Mayekar, Kishor D., 4,536,322, Cl. 252-301.160.
Mayer, Gilbert: *See*—
Malivoir, Roger; and Mayer, Gilbert, 4,535,882, Cl. 198-425.000.
Mayer, Leonard C., to Morganite Incorporated. Electrical brushes with wear sensors. 4,536,670, Cl. 310-249.000.
Mayer, Robert: *See*—
Kaye, Lawrence A.; and Mayer, Robert, 4,536,722, Cl. 331-117.00D.
Mazda Motor Corporation: *See*—
Kijima, Takao; Maebayashi, Jiro; and Ando, Fumitaka, 4,536,007, Cl. 280-701.000.
McCandliss, Russell J.; Eastwood, Barbara J.; and Milch, Robert A., to IGI Biotechnology, Inc. Nematocidally active chitin-protein complex. 4,536,207, Cl. 71-88.000.
McCarty, George W.; Rebold, Jerome I.; and Smith, Somers H., III, to Solid State Chargers Research and Development. Battery-operated device with wall-mounted support. 4,536,694, Cl. 320-2.000.
McClung, James A.: *See*—
Bulso, Joseph D., Jr.; Doyle, Stephen D.; and McClung, James A., 4,535,618, Cl. 72-349.000.
McCorriston, Lois L., to Gulf Canada Limited. Process using carbonate reagent for recovering vanadium from cokes and ashes derived from heavy oils. 4,536,374, Cl. 423-68.000.
McDonald, Joseph K.; and Merritt, James A., to United States of America, Army. Laser-induced production of nitrosyl fluoride for etching of semiconductor surfaces. 4,536,252, Cl. 156-662.000.
McGarry, Phillip E.: *See*—
Burgess, Lester E.; Fox, Karl M.; McGarry, Phillip E.; and Herman, David E., 4,536,372, Cl. 422-187.000.
McGee, John R.: *See*—
Kirkpatrick, Lloyd V.; and McGee, John R., 4,535,851, Cl. 175-38.000.
McGibbon, Gregor D.: *See*—
Skidanenko, Constantine V.; and McGibbon, Gregor D., 4,536,614, Cl. 179-18.0FA.
McGuire, Hugh K. Flexible duct forming apparatus. 4,536,246, Cl. 156-429.000.
McHarg, Robert E.: *See*—
White, John B., Jr.; McHarg, Robert E.; and Stolfa, Frank, 4,536,280, Cl. 208-106.000.
McIntosh, Ian A. Air vent. 4,535,715, Cl. 114-211.000.
McKittrick, Mike T.: *See*—
Renger, Larry H.; and McKittrick, Mike T., 4,536,166, Cl. 446-298.000.
McMann, Renville H., Jr., to Thomson-CSF Broadcast, Inc. Television method and apparatus. 4,536,799, Cl. 358-219.000.
McManus, Gregory K.; and Otani, Masato, to Microdry Corporation. Spaghetti dryer. 4,535,552, Cl. 34-236.000.
McMurtry, David R., to Renishaw plc. Position-sensing apparatus. 4,536,661, Cl. 307-119.000.
McRae, Thomas G.: *See*—
Bianchini, Gregory M.; and McRae, Thomas G., 4,535,639, Cl. 73-863.110.
McRea, James C.: *See*—
Kim, Wan S.; Jeong, Seo Y.; and McRea, James C., 4,536,572, Cl. 536-179.000.
MDS Qantel, Inc.: *See*—
Ringel, Gerhard; and Fencsik, Gabor, 4,536,838, Cl. 364-200.000.
Mead Corporation, The: *See*—
Sanders, Frederick W., 4,536,463, Cl. 430-138.000.
Suttles, James M., 4,535,704, Cl. 108-108.000.
Meador, Richard A.: *See*—
Davis, Mark H.; Meador, Richard A.; and Wisler, Macmillan M., 4,536,713, Cl. 324-324.000.
Medical Biological Sciences, Inc.: *See*—
Ashman, Arthur; and Bruins, Paul F., 4,535,485, Cl. 623-16.000.
Bruins, Paul F.; and Ashman, Arthur, 4,536,158, Cl. 433-201.100.
Medipack AG: *See*—
Artusi, Aldo, 4,535,890, Cl. 206-530.000.
Medtronic, Inc.: *See*—
Olson, Walter H., 4,535,774, Cl. 128-419.0PG.
Mehl, Wolfgang, to International Toner Specialties. Encapsulated particulate magnetic development powders containing a sublimable dyestuff. 4,536,462, Cl. 430-106.000.
Meiji Seika Kaisha Ltd.: *See*—
Ito, Tatsuo; Oba, Kazunori; Fukuyasu, Harumi; Niwa, Tomizo; Shomura, Takashi; and Kazuno, Yuzo, 4,536,398, Cl. 514-43.000.
Kishi, Yoshito, 4,536,336, Cl. 260-351.100.
Melgert, Frederik B.: *See*—
Ponjee, Johannes J.; and Melgert, Frederik B., 4,536,416, Cl. 427-131.000.
Mercado Venture, The: *See*—
Gobeli, Garth W., 4,536,746, Cl. 340-365.00A.
Mercer, Frank B., to P.L.G. Research Limited. Plastics material mesh structure. 4,536,429, Cl. 428-136.000.
Merck & Co., Inc.: *See*—
Biftu, Tesfaye; Witzel, Bruce E.; and Barker, Peter L., 4,536,512, Cl. 514-413.000.
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., 4,536,507, Cl. 514-362.000.
Merck Frosst Canada, Inc.: *See*—
Belanger, Patrice C.; and Gillard, John W., 4,536,515, Cl. 514-532.000.
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., 4,536,507, Cl. 514-362.000.
Merritt, Herbert E.: *See*—
Borisch, Donald J.; Hanrahan, Gary V.; and Merritt, Herbert E., 4,536,849, Cl. 364-550.000.
Merritt, James A.: *See*—
McDonald, Joseph K.; and Merritt, James A., 4,536,252, Cl. 156-662.000.

Mertz, Denny W., to Emerson Electric Co. Pilot operated valve with pressure relief. 4,535,805, Cl. 137-489.000.
Merz, Herbert: *See*—
Rossmann, Axel; and Merz, Herbert, 4,536,127, Cl. 415-174.000.
Mesey, Milton; Shcwaighofer, Roman; and Donner, Meinrad, to Maag Gear-Wheel & Machine Company Limited. Profiling apparatus for a grinding wheel in a gear grinding machine. 4,535,573, Cl. 51-165.870.
Mesnel, Francois, to Etablissements Mesnel. Window seal. 4,535,563, Cl. 49-478.000.
Metabi, Tsuneyo: *See*—
Maekawa, Yukio; Metabi, Tsuneyo; and Niwa, Masatake, 4,536,071, Cl. 354-400.000.
Metako Kigyo Co., Ltd.: *See*—
Fukuchi, Shigeki, 4,535,829, Cl. 160-291.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Albrecht, Johannes; Jakobs, Rudolf; Turna, Osman; Vierrath, Helmut; Weil, Manfred; and Zapke, Klaus, 4,536,193, Cl. 48-77.000.
Metz, Arthur J.; and Schlotzhauer, Kenneth G., to Tektronix, Inc. Trigger coupling circuit for providing a plurality of coupling modes. 4,536,666, Cl. 307-494.000.
Meuli, William P.: *See*—
Chiang, Anne; and Meuli, William P., 4,536,251, Cl. 156-657.000.
Miaskoff, Leonard, to Harris Corporation. Palletizing apparatus with layer level detecting means. 4,536,119, Cl. 414-100.000.
Micro Plastics, Inc.: *See*—
Ramey, Carl; Hill, Royce W.; and Beijen, James H., 4,535,925, Cl. 227-55.000.
Microdry Corporation: *See*—
McManus, Gregory K.; and Otani, Masato, 4,535,552, Cl. 34-236.000.
Micso, Peter F., Jr.: *See*—
Kim, Choung U.; and Micso, Peter F., Jr., 4,536,335, Cl. 260-245.20T.
Mid-Continent Screw Products Company: *See*—
Yamashiro, Ernest, 4,536,117, Cl. 411-411.000.
Mihara, Yuji, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,536,473, Cl. 430-575.000.
Mikami, Yoshiharu: *See*—
Izumi, Asashiro; Mikami, Yoshiharu; and Yamada, Seiji, 4,535,855, Cl. 177-1.000.
Mikroyannidis, John A., to United States of America, National Aeronautics and Space Administration. Fire-resistant phosphorus containing polyimides and copolyimides. 4,536,565, Cl. 528-352.000.
Milch, Robert A.: *See*—
McCandliss, Russell J.; Eastwood, Barbara J.; and Milch, Robert A., 4,536,207, Cl. 71-88.000.
Mildenberger, Hilmar: *See*—
Hertenstein, Ulrich; Mildenberger, Hilmar; Sachse, Burkhard; and Hartz, Peter, 4,536,509, Cl. 514-383.000.
Mildrex International, B.V.: *See*—
Sanzenbacher, Charles W., 4,536,213, Cl. 75-91.000.
Miletti, Sandro: *See*—
Carobbi, Renato; Miletti, Sandro; and Franci, Vittorio, 4,536,221, Cl. 127-30.000.
Miller, Donald L.; and Przybysz, John X., to Westinghouse Electric Corp. High di/dt, light-triggered thyristor with etched moat current limiting resistors. 4,536,783, Cl. 357-38.000.
Miller, Elwood O., to BOC Group, Inc., The. Time controlled gas flows. 4,535,812, Cl. 137-624.110.
Miller, Gerald W.; and Lutzmann, H. Harald. Plasticized polyvinyl alcohol compositions, forming process and formed articles. 4,536,532, Cl. 524-141.000.
Miller, Ira; Rumbaugh, Robert C.; and Price, John J., Jr., to Motorola, Inc. Comparator circuit having full supply common mode input. 4,536,663, Cl. 307-355.000.
Miller, William H., to General Electric Company. Dynamoelectric machine stator mounting means and method of making same. 4,536,671, Cl. 310-258.000.
Millheim, Keith K.; and Warren, Tom M., to Standard Oil Co. (Indiana). System to control the vertical movement of a drillstring. 4,535,972, Cl. 254-277.000.
Milton Bradley Company: *See*—
Hughes, David C., 4,536,167, Cl. 446-396.000.
Mims, Herman. Sorting apparatus for food items. 4,535,881, Cl. 198-420.000.
Minaev, Alexandr S.: *See*—
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.
Minges, Peter: *See*—
Hambrecht, Juergen; Reffert, Rudi W.; Minges, Peter; and Swoboda, Johann, 4,536,567, Cl. 528-486.000.
Minnesota Mining and Manufacturing Company: *See*—
Berg, Harvey J., 4,536,440, Cl. 428-284.000.
Maki, Farrel M., 4,536,681, Cl. 315-309.000.
van den Honert, Christopher; and Stypulkowski, Paul H., 4,535,785, Cl. 128-746.000.
Minolta Camera Kabushiki Kaisha: *See*—
Taniguchi, Nobuyuki; Ishikawa, Norio; and Egawa, Takeshi, 4,536,072, Cl. 354-403.000.
Watanabe, Yutaka; and Fukumoto, Fumio, 4,535,981, Cl. 271-121.000.
Mio, Mitsushi; and Negita, Hisao, to Awaji Sangyo Kabushiki Kaisha; and Negita, Hisao. Solid-body heating unit. 4,536,645, Cl. 219-543.000.
Miroshnik, Vladimir I.: *See*—
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.
Mirzabekian, Garri Z.: *See*—
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.
Misiorny, Alfons: *See*—
Helgstrand, Åke J. E.; Johansson, Karl N. G.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran B., 4,536,400, Cl. 514-120.000.
Missimer, Dale J.; and St. Pierre, Michael R., to Marin Tek, Inc. Fast cycle water vapor cryopump. 4,535,597, Cl. 62-55.500.
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member having multiple amorphous layers. 4,536,459, Cl. 430-57.000.
Misumi, Teruo: *See*—
Kanbe, Junichiro; Shirai, Shigeru; Misumi, Teruo; Saitoh, Keishi; and Osato, Yoichi, 4,536,460, Cl. 430-57.000.
Mita Industrial Co., Ltd.: *See*—
Nakatani, Kaname; Hanna, Junichi; and Kokado, Hiroshi, 4,536,461, Cl. 430-58.000.
Mitchell, Alexander M.: *See*—
Jablway, Ali N.; and Mitchell, Alexander M., 4,536,703, Cl. 324-52.000.
Mitsubishi Chemical Industries Ltd.: *See*—
Jikihara, Tetsuo; Oda, Masatsugu; Natsume, Bunji; Watanabe, Hisao; and Suzuki, Seiichi, 4,536,209, Cl. 71-96.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Denda, Masahiko; Sato, Shinichi; Tsubouchi, Natsuro; Kinoshita, Shigeji; and Ohbayashi, Yoshikazu, 4,535,530, Cl. 29-571.000.
Matsumura, Susumu; Yano, Masao; Sashida, Nobuo; and Yamamoto, Yoshihiko, 4,536,816, Cl. 361-91.000.
Morishita, Akira, 4,536,669, Cl. 310-241.000.
Nawa, Akiyoshi; and Kato, Yoshiaki, 4,536,634, Cl. 219-74.000.
Onizuka, Masahiro, 4,536,633, Cl. 219-69.00D.
Takami, Akira, 4,535,737, Cl. 123-420.000.
Mitsubishi Gas Chemical Co., Inc.: *See*—
Kida, Koichi; Kawai, Yoshio; Tamura, Yutaka; and Suzuki, Yoshiharu, 4,536,605, Cl. 585-640.000.
Mitsuboshi Belting Ltd.: *See*—
Fujiki, Toshiaki; and Kano, Hikaru, 4,535,581, Cl. 52-746.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Nishizawa, Tsutomu; Tukahara, Ryoichi; Morinaka, Ryoichi; and Hidaka, Tuneo, 4,536,320, Cl. 252-299.100.
Miura, Norio: *See*—
Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, 4,536,436, Cl. 428-212.000.
Miura, Takeo: *See*—
Tanaka, Norio; Miura, Takeo; and Miyata, Jiro, 4,536,005, Cl. 280-289.00S.
Miyahara, Hiroyuki: *See*—
Hirota, Akira; Miyahara, Hiroyuki; and Kosaka, Yoshiteru, 4,536,795, Cl. 358-160.000.
Miyake, Masanobu: *See*—
Maruyama, Jisaburou; Fukayama, Sumio; Miyake, Masanobu; Watanabe, Yoshimi; and Eguchi, Yoshinori, 4,536,676, Cl. 313-318.000.
Miyasato, Tsutomu: *See*—
Yamaguchi, Hirohisa; Yamada, Kazuo; and Miyasato, Tsutomu, 4,536,745, Cl. 340-347.0DD.
Miyashita, Teruo: *See*—
Masuda, Takanori; Kakei, Tsutomu; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,536,264, Cl. 204-129.430.
Miyata, Jiro: *See*—
Tanaka, Norio; Miura, Takeo; and Miyata, Jiro, 4,536,005, Cl. 280-289.00S.
Miyatake, Fumio: *See*—
Ogawa, Hiroyasu; Shigei, Tetsuro; Takahashi, Hayashi; Okabe, Tetuya; and Miyatake, Fumio, 4,536,448, Cl. 428-394.000.
Miyauchi, Hirotsugu: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,536,352, Cl. 260-543.00F.
Miyazaki, Wasei; Sato, Tsuneo; Nakayama, Yasuo; and Sato, Tadao, to Otsuka Pharmaceutical Co. Process for preparing urokinase complex. 4,536,391, Cl. 424-94.000.
Mizogui, Toyokazu: *See*—
Someya, Hiromi; Suzuki, Nobuyuki; and Mizogui, Toyokazu, 4,536,074, Cl. 354-442.000.
Mizuguchi, Ryuzo: *See*—
Yamamoto, Yoshikazu; Mizuguchi, Ryuzo; and Yamada, Yasuyuki, 4,536,474, Cl. 435-42.000.
Mizuno Corporation: *See*—
Nobuta, Yoshiji, 4,536,739, Cl. 340-323.00R.

Mizuno, Toshiaki: *See—*
Taura, Mitsuharu; and Mizuno, Toshiaki, 4,535,736, Cl. 123-344.000.

Moates, Roger D., to Westinghouse Electric Corp. Matrix encoder for sensor arrays. 4,536,762, Cl. 340-870.020.

Mobil Oil Corporation: *See—*
Audeh, Costandi A., 4,536,279, Cl. 208-11.00R.
Braid, Milton; and Landis, Phillip S., 4,536,192, Cl. 44-68.000.
Collins, Gregory P., 4,536,271, Cl. 204-192.00E.
Donaldson, Jack J., 4,536,362, Cl. 264-171.000.
Frangatos, Gerassimos, 4,536,312, Cl. 252-47.500.
Horodysky, Andrew G.; and Landis, Phillip S., 4,536,306, Cl. 252-32.70E.
Horodysky, Andrew G., 4,536,307, Cl. 252-32.70E.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,536,309, Cl. 252-33.000.
Horodysky, Andrew G., 4,536,311, Cl. 252-51.50A.
Lyle, W. D., Jr., 4,535,625, Cl. 73-152.000.
Otto, John B., Jr.; and Paul, James M., 4,536,034, Cl. 299-5.000.
Rollmann, Louis D., 4,536,282, Cl. 208-120.000.
Toon, Michael B., 4,536,199, Cl. 55-67.000.

Mochida, Haruo, to Nissan Motor Co., Ltd. Emergency unlocking mechanism for door of automobile. 4,536,021, Cl. 292-201.000.

Mochimaru, Hideaki, to Ricoh Company, Ltd. Sheet feeding cassette latching system. 4,535,982, Cl. 271-127.000.

Moertel, George B., to Talon, Inc. Apparatus for continuously molding of articles with plural band-like members. 4,536,143, Cl. 425-115.000.

Moffett, David J.: *See—*
Kruse, Richard M.; Moffett, David J.; Patel, Madhu C.; and Barnes, Ronald L., 4,536,648, Cl. 235-454.000.

Mohn, Hans-Werner: *See—*
Buchholz, Rainer; Tomashauser, Josef; Zodrow, Rudolf; and Mohn, Hans-Werner, 4,536,247, Cl. 156-477.100.

Molbaek, Jens J.: *See—*
Jacobsen, Finn; Molbaek, Jens J.; Zangenberg, Jan; and Dam, Poul S., 4,535,590, Cl. 60-531.000.

Molinari, Paul J., to Allen Manufacturing Company. Socket bit holder. 4,535,658, Cl. 81-177.850.

Mollberg, Henri R.: *See—*
Hansen, Bertil V.; Kelfve, Sten S.; and Mollberg, Henri R., 4,536,187, Cl. 44-51.000.

Monsanto Company: *See—*
Deex, Oliver D., 4,536,562, Cl. 528-193.000.

Montagna, Angelo A.: *See—*
Pirkle, James C., Jr.; Montagna, Angelo A.; and Ruziska, Philip A., 4,536,380, Cl. 423-359.000.

Montedison S.p.A.: *See—*
Gardano, Andrea; Francalcanci, Franco; and Foa, Marco, 4,536,595, Cl. 562-406.000.

Montgomery, John A.: *See—*
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., 4,536,575, Cl. 544-279.000.

Mookherjee, Braja D.; Chant, Bernard J.; Evers, William J.; Wilson, Richard A.; Zampino, Michael J.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Process for preparing mixtures containing 8,9-epithio-1-p-menthene. 4,536,583, Cl. 549-1.000.

Moplefan S.p.A.: *See—*
Mauri, Luigi; and Cardaio, Rino, 4,536,453, Cl. 428-484.000.

Mordre, Sigurd C.: *See—*
Olsen, John H.; and Mordre, Sigurd C., 4,536,135, Cl. 417-383.000.

Morehead, Jesse L.: *See—*
Jones, Thomas F.; and Morehead, Jesse L., 4,535,544, Cl. 33-265.000.

Morehouse, Alpha L.; and Lewis, Charles J., to Grain Processing Corporation. Low fat spread. 4,536,408, Cl. 426-256.000.

Moreno, Robert J.: *See—*
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,536,836, Cl. 364-200.000.

Morgan Construction Company: *See—*
Custer, Donald J., 4,535,955, Cl. 242-158.00R.

Morgan, Michael J.; and Gray, Steven G. "Hole-in-one" metal punch drive unit. 4,535,540, Cl. 30-358.000.

Morganite Incorporated: *See—*
Mayer, Leonard C., 4,536,670, Cl. 310-249.000.

Mori, Kei. Lighting device. 4,536,828, Cl. 362-32.000.

Mori, Yoshio: *See—*
Hashimoto, Kiyoyasu; Yoshinaga, Kenji; Mori, Yoshio; Seino, Junzaburo; Kenmochi, Hirohito; and Sato, Katsunobu, 4,536,569, Cl. 534-575.000.

Moriguchi, Haruhiko: *See—*
Inui, Toshiharu; and Moriguchi, Haruhiko, 4,536,774, Cl. 346-76.0PH.

Moriguchi, Kisoo; and Ikegami, Tadashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyethylene composition. 4,536,550, Cl. 525-240.000.

Morimoto, Yoshiro: *See—*
Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,536,171, Cl. 474-28.000.

Morinaka, Ryoichi: *See—*
Nishizawa, Tsutomu; Tukahara, Ryoichi; Morinaka, Ryoichi; and Hidaka, Tuneo, 4,536,320, Cl. 252-299.100.

Morino, Seiji: *See—*
Yoshinaga, Toru; Igashira, Toshihiko; Kawai, Hisasi; Morino, Seiji; and Nakamura, Norihiko, 4,535,735, Cl. 123-310.000.

Morishima, Masayuki: *See—*
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,536,631, Cl. 219-10.770.

Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Direct current motor. 4,536,669, Cl. 310-241.000.

Morita, Akira: *See—*
Masuda, Takanori; Kakei, Tsutomu; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,536,264, Cl. 204-129.430.

Morita, Hirobumi: *See—*
Matsubara, Soichi; Morita, Hirobumi; and Watanabe, Shinpei, 4,535,927, Cl. 228-6.100.

Morrin, James F.: *See—*
Polk, Todd J.; and Morrin, James F., 4,535,759, Cl. 128-24.00A.

Morse, Donald K.: *See—*
Gagliardo, John P.; Morse, Donald K.; and Pruneau, Albert, Jr., 4,535,846, Cl. 169-25.000.

Morton, Steven G., to International Telephone and Telegraph Corporation. Impedance restoration for fast carry propagation. 4,536,855, Cl. 364-786.000.

Moser, Franz; and Steinemann, Max, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Cartridge case and apparatus for producing the same. 4,535,697, Cl. 102-468.000.

Mosher, Oren A.; and Douglas, Ellwood S., to Package Machinery Co. Combination weighing machine having short search. 4,535,856, Cl. 177-1.000.

Moskal, Walter J.: *See—*
Grammas, James J.; Moskal, Walter J.; and Witt, Craig J., 4,535,533, Cl. 29-749.000.

Mosley, Joseph M.: *See—*
Bhatia, Harsaran S.; Dorler, Jack A.; Gaur, Santosh P.; Lechaton, John S.; Mosley, Joseph M.; and Srinivasan, Gurumakonda R., 4,535,531, Cl. 29-577.00C.

Moss, Stanley D.: *See—*
Rattlingourd, Glen D.; Currie, Robert J.; and Moss, Stanley D., 4,536,878, Cl. 371-43.000.

Motohashi, Mitsuo; Nemoto, Mitsugu; and Tamura, Akihiko, to Konishiroku Photo Industry Co., Ltd. Transfer type electrostatic reproducing apparatus. 4,536,082, Cl. 355-3.0SH.

Motoren-Und Turbinen-Union: *See—*
Rossmann, Axel; and Merz, Herbert, 4,536,127, Cl. 415-174.000.

Motorola, Inc.: *See—*
Miller, Ira; Rumbaugh, Robert C.; and Price, John J., Jr., 4,536,663, Cl. 307-355.000.
Reid, Sydney J., Jr.; and Zlotnick, Fredrick, 4,536,798, Cl. 358-197.000.

Mouche , Richard J.: *See—*
Yeoman, Alan M.; and Mouche , Richard J., 4,535,622, Cl. 73-61.200.

Mount, Gordon L., to Carrier Corporation. Method and control system for verifying sensor operation in a refrigeration system. 4,535,598, Cl. 62-126.000.

Mount, Gordon L., to Carrier Corporation. Method and control system for limiting the load placed on a refrigeration system upon a recycle start. 4,535,607, Cl. 62-201.000.

Mueller, Warren B., to Ethyl Corporation. Polyphosphazene foam process. 4,536,520, Cl. 521-89.000.

Muller, Lutz: *See—*
Junge, Bodo; and Muller, Lutz, 4,536,493, Cl. 514-25.000.

Muller, Wolfgang: *See—*
Keller, Tony W.; and Muller, Wolfgang, 4,535,595, Cl. 62-3.000.

Multiplex Company, Inc.: *See—*
Trewhella, Joseph M., 4,535,917, Cl. 222-129.100.

Munch, Hans-Jurgen: *See—*
Freese, Karl-Heinz; and Munch, Hans-Jurgen, 4,536,525, Cl. 523-414.000.

Munden, Curtis D.: *See—*
Johnston, Ralph H.; Munden, Curtis D.; and Sheldrake, Leonard J., 4,536,697, Cl. 322-14.000.

Murakami, Tsuyoshi: *See—*
Tsutsumikoshi, Shinobu; Goto, Akira; Murakami, Tsuyoshi; Takasaka, Masao; and Shinohara, Yoshiki, 4,535,869, Cl. 180-311.000.

Murakami, Yoshinobu: *See—*
Ito, Akio; Matsuda, Shunsuke; Murakami, Yoshinobu; and Tamura, Tooru, 4,536,267, Cl. 204-159.230.

Muranaka, Shiaru: *See—*
Tanaka, Hideo; and Muranaka, Shiaru, 4,535,583, Cl. 53-75.000.

Murase, Kazuhiro: *See—*
Kawamoto, Kinji; Tsukamoto, Masao; Murase, Kazuhiro; Kaneaki, Tetsuhiko; and Nikaido, Masataka, 4,536,853, Cl. 364-718.000.

Murase, Shigemitsu, to Unitika Ltd. Method of manufacturing polyester fibers with good adhesion to rubber. 4,536,526, Cl. 523-433.000.

Murata Kikai Kabushiki Kaisha: *See—*
Nakahara, Teiji; Sakai, Shoji; Noda, Koshi; Fujiwara, Michiaki; and Kubota, Nobunori, 4,535,944, Cl. 242-35.50A.

Murata, Yasuzo; and Sato, Hiroshi, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Magnetic display panel. 4,536,428, Cl. 428-117.000.

Murdick, Brian K.; and Haase, William H., to International Paper Company. Taco tray. 4,535,891; Cl. 206-564.000.

Murley, Jackie D.; and Johnson, Marion, to Cosden Technology, Inc. Apparatus for making a thin walled container from a plastic resin. 4,536,148, Cl. 425-387.100.

Murphy, Wesley W., III; and Naimpally, Saiprasad V., to RCA Corporation. Demodulated chrominance signal filter with peaked response. 4,536,787, Cl. 358-38.000.

Murray, D. Gary: *See—*
Guillet, James E.; Heskins, Michael; and Murray, D. Gary, 4,536,294, Cl. 210-730.000.

Murray, Pierre C., to MacLean-Fogg Company. Composite molded plastic article. 4,536,116, Cl. 411-82.000.

Musto, Franklyn K.; Bourn, Hugh E.; Buchanan, John; and Kay, Duncan A., to Musto & Hyde Accessories Ltd. Dry suit. 4,535,477, Cl. 2-2.10R.

Musto & Hyde Accessories Ltd.: *See—*
Musto, Franklyn K.; Bourn, Hugh E.; Buchanan, John; and Kay, Duncan A., 4,535,477, Cl. 2-2.10R.

Mycynek, Victor G.: *See—*
Hauge, Raymond C.; and Mycynek, Victor G., 4,536,717, Cl. 330-254.000.

Myers, John H.: *See—*
Hattori, Kiyoshi; and Myers, John H., 4,536,549, Cl. 525-240.000.

Nachbur, Hermann; and Tempel, Christel, to Ciba-Geigy Corporation. Heat-sensitive recording material. 4,536,779, Cl. 346-212.000.

Nadelson, Jeffrey: *See—*
Brand, Leonard J.; and Nadelson, Jeffrey, 4,536,499, Cl. 514-212.000.

Naden, David: *See—*
Ochs, Leonard R.; Fletcher, Archibald W.; Weber, Harald; and Naden, David, 4,536,214, Cl. 75-101.00R.

Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Voltage-current converting circuit. 4,536,701, Cl. 323-315.000.

Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Constant current source or voltage source transistor circuit. 4,536,702, Cl. 323-316.000.

Nagano, Teruo: *See—*
Nagashima, Akira; Hasegawa, Akira; Aoai, Toshiaki; and Nagano, Teruo, 4,536,464, Cl. 430-192.000.

Nagao, Makoto; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,536,443, Cl. 428-336.000.

Nagashima, Akira, to Kioritz Corporation. Tank cap for powered machine. 4,535,910, Cl. 220-377.000.

Nagashima, Akira; Hasegawa, Akira; Aoai, Toshiaki; and Nagano, Teruo, to Fuji Photo Film Company Limited. Photosensitive composition with o-quinonediazide compound and condensate of dihydric phenol and aldehyde or ketone. 4,536,464, Cl. 430-192.000.

Nagumo, Shuzo; Ogura, Setsuo; and Kitamura, Yukinori, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Semiconductor device having a junction capacitance, an integrated injection logic circuit and a transistor in a semiconductor body. 4,536,784, Cl. 357-48.000.

Nagura, Keisuke. Belt buckle. 4,536,094, Cl. 368-278.000.

Nagy, Janos. Power source from generating caused by braking electric powered vehicles. 4,535,861, Cl. 180-53.500.

Nahara, Akira: *See—*
Nagao, Makoto; and Nahara, Akira, 4,536,443, Cl. 428-336.000.

Naiman, Michael I.; and Schield, John A., to Petrolite Corporation. Ester-containing halopolyalkylenes. 4,536,191, Cl. 44-62.000.

Naiman, Michael I.; and Schield, John A., to Petrolite Corporation. Ester-containing halopolyalkylenes. 4,536,551, Cl. 525-334.100.

Naimpally, Saiprasad V., to RCA Corporation. Demodulated chrominance signal filter using impedance mismatched sections. 4,536,788, Cl. 358-38.000.

Naimpally, Saiprasad V.: *See—*
Murphy, Wesley W., III; and Naimpally, Saiprasad V., 4,536,787, Cl. 358-38.000.

Nakahara, Teiji; Sakai, Shoji; Noda, Koshi; Fujiwara, Michiaki; and Kubota, Nobunori, to Murata Kikai Kabushiki Kaisha. Spinning machine with a doffing apparatus. 4,535,944, Cl. 242-35.50A.

Nakamichi Corporation: *See—*
Uchikoshi, Gohji, 4,536,743, Cl. 340-347.0DA.

Nakamura, Kazumasa: *See—*
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,535,864, Cl. 180-177.000.
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,535,865, Cl. 180-177.000.

Nakamura, Kiyofumi: *See—*
Futakuchi, Takashi; Nakamura, Kiyofumi; Sato, Yoshimasa; Tsukuda, Toshio; and Shiraishi, Hiroyuki, 4,536,211, Cl. 75-5.000.

Nakamura, Masaru; and Kuse, Takashi, to Kabushiki Kaisha Komatsu Seisakusho. Fluid operated transmission control system. 4,535,681, Cl. 91-527.000.

Nakamura, Michio: *See—*
Tokita, Kiyoshi; Sone, Toshinao; and Nakamura, Michio, 4,535,907, Cl. 220-2.10A.

Nakamura, Norihiko: *See—*
Yoshinaga, Toru; Igashira, Toshihiko; Kawai, Hisasi; Morino, Seiji; and Nakamura, Norihiko, 4,535,735, Cl. 123-310.000.

Nakamura, Tohru: *See—*
Suzuki, Toshiyuki; Nakamura, Tohru; and Tsutsumi, Hisao, 4,536,519, Cl. 514-785.000.

Nakamura, Toshio: *See—*
Sasaki, Yutaka; Kiyomiya, Yutaka; Nakamura, Toshio; Nakamura, Yoshimi; and Yamaguchi, Masanori, 4,536,483, Cl. 502-20.000.

Nakamura, Yoshimi: *See—*
Sasaki, Yutaka; Kiyomiya, Yutaka; Nakamura, Toshio; Nakamura, Yoshimi; and Yamaguchi, Masanori, 4,536,483, Cl. 502-20.000.

Nakano, Yoshikatsu; and Matsuura, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Valve disabling device for internal combustion engines. 4,535,732, Cl. 123-90.160.

Nakatani, Kaname; Hanna, Junichi; and Kokado, Hiroshi, to Mita Industrial Co., Ltd. Laminated photosensitive material and process for production thereof. 4,536,461, Cl. 430-58.000.

Nakayama, Yasuo: *See—*
Miyazaki, Wasei; Sato, Tsuneo; Nakayama, Yasuo; and Sato, Tadao, 4,536,391, Cl. 424-94.000.

Nakazono, Shuzo. Method of producing protein-rich forage or nitrogenous fertilizer from fowl droppings, swine dung, cow dung and the like. 4,536,412, Cl. 426-641.000.

Nalco Chemical Company: *See—*
Yeoman, Alan M.; and Mouche , Richard J., 4,535,622, Cl. 73-61.200.

Namnath, James S., to Lever Brothers Company. Manganese bleach activators. 4,536,183, Cl. 8-107.000.

Nara, Michiko; Yamazaki, Kazunori; and Akiyama, Yasuko, to Shiseido Company Ltd. Make-up cosmetics composition. 4,536,405, Cl. 514-781.000.

Narita, Masao: *See—*
Komatsu, Tatsuyoshi; Numata, Shigeaki; Sumino, Toshihiko; Matsuzaki, Katsumi; Narita, Masao; and Hioki, Katsuhiko, 4,536,337, Cl. 260-396.00R.

Narita, Ryuhei; Aida, Hiroyuki; and Kamiya, Yoshinori, to Nissan Motor Company, Limited. Door glass hinge having a spacer ring. 4,535,503, Cl. 16-382.000.

Naslund, Erik I.; and Reed, Steven P., to Brown & Williamson Tobacco Corporation. Apparatus for making grooves in cigarette filters. 4,536,149, Cl. 425-394.000.

Natchev, Emil J. Mechanical bio-feed-back auto-traction bench. 4,535,762, Cl. 128-71.030.

National Distillers and Chemical Corporation: *See—*
Barlow, Anthony; and Maringer, Melvin F., 4,536,530, Cl. 524-109.000.
Hanes, Ronnie M., 4,536,340, Cl. 260-410.90R.
Harris, Eugene G., 4,536,349, Cl. 252-522.00R.
Speca, Anthony N., 4,536,487, Cl. 502-119.000.

National Petro Chemicals Corporation: *See—*
Speca, Anthony N.; and Laib, Roger D., 4,536,489, Cl. 502-162.000.

Natsume, Bunji: *See—*
Jikihara, Tetsuo; Oda, Masatsugu; Natsume, Bunji; Watanabe, Hisao; and Suzuki, Seiichi, 4,536,209, Cl. 71-96.000.

Navarro, Luis J.; Peter, Joseph R.; and Blair, Bruce W., to Tektronix, Inc. Signal-envelope display system for a digital oscilloscope. 4,536,760, Cl. 340-722.000.

Nawa, Akiyoshi; and Kato, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Hot wire arc welding torch assembly. 4,536,634, Cl. 219-74.000.

Nawata, Kazuyoshi: *See—*
Yokoshima, Minoru; Nawata, Kazuyoshi; Ohkubo, Tetsuo; and Hattori, Hideaki, 4,536,588, Cl. 549-374.000.

NCR Canada Ltd - NCR Canada Ltee: *See—*
Calnek, Trevor A.; and Bray, John E., 4,536,775, Cl. 346-76.0PH.

NCR Corporation: *See—*
Kruse, Richard M.; Moffett, David J.; Patel, Madhu C.; and Barnes, Ronald L., 4,536,648, Cl. 235-454.000.
Sheehan, Bernard P.; and Werwick, Volker, 4,536,098, Cl. 400-196.100.

Neale, David M.: *See—*
Bickerstaff, Alan E.; Cotton, Austin H.; Ladell, Michael G.; and Neale, David M., 4,536,076, Cl. 355-3.0FU.

Neale, Thomas J., to Foster Wheeler Energy Corporation. Multi-purge gate valve for particulate solids flow. 4,535,801, Cl. 137-240.000.

NEC Corporation: *See—*
Fujii, Akira, 4,536,662, Cl. 307-270.000.

Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, to Schering Aktiengesellschaft. 11β-aryl estradienes, processes for their production and pharmaceutical preparations containing them. 4,536,401, Cl. 514-173.000.

Negita, Hisao: *See—*
Mio, Mitsushi; and Negita, Hisao, 4,536,645, Cl. 219-543.000.

Neil Brown Instrument Systems, Inc.: *See—*
Brown, Neil L., 4,536,744, Cl. 340-347.0AD.

Nekoosa Envelopes, Inc.: *See—*
Ward, James O., 4,535,930, Cl. 229-71.000.

Nelligan, Jerome M.: *See—*
Saxton, Robert W.; Hewitt, William R.; and Nelligan, Jerome M., 4,536,108, Cl. 408-230.000.

Nels, James S.: *See—*
Ruth-Larson, Dawn; and Nels, James S., 4,535,481, Cl. 2-114.000.

Nelson, Peter H.; Ringold, Howard J.; Unger, Stefan H.; and Thieme, Thomas R., to Syntex (U.S.A.) Inc. Naphthoxyalkylamines and related compounds as antiinflammatory agents. 4,536,503, Cl. 514-255.000.

Nelson, Shelby W. Combination non-disposable table utensil. 4,535,538, Cl. 30-147.000.

Nemoto, Mitsugu: *See—*
Motohashi, Mitsuo; Nemoto, Mitsugu; and Tamura, Akihiko, 4,536,082, Cl. 355-3.0SH.

Neri, Anthony A.: *See—*
De Bisschop, James; Neri, Anthony A.; and Williams, Thomas J., 4,535,645, Cl. 74-492.000.

Neu, Frank D.: *See—*
Jerome, Jonathan A.; Neu, Frank D.; and Wohlmut, Peter G., 4,536,866, Cl. 369-112.000.

Neumaier, Anton: *See*—
Hunger, Josef; and Neumaier, Anton, 4,536,109, Cl. 408-240.000.
Neumaier, Hubert, to Hoechst Aktiengesellschaft. Process for making aryldichlorophosphanes. 4,536,351, Cl. 260-543.00P.
Neuroth, David H., to Harvey Hubbell Incorporated. Oil well electrical cable with gas conducting channel and vent. 4,536,609, Cl. 174-11.00R.
Newell, Alfred T., Jr.; and Newell, Alfred T., III, to A. T. Newell Co. Inc. Environmental control system. 4,535,601, Cl. 62-171.000.
Newell, Alfred T., III: *See*—
Newell, Alfred T., Jr.; and Newell, Alfred T., III, 4,535,601, Cl. 62-171.000.
Ng, Dominic S., to Xerox Corporation. Migration imaging system. 4,536,458, Cl. 430-41.000.
Nguyen, Tuan A.: *See*—
Lippolis, Craig S.; and Nguyen, Tuan A., 4,536,079, Cl. 355-14.00R.
Nicholson, Denzel A.: *See*—
Llenado, Ramon A.; Mao, Mark H. K.; and Nicholson, Denzel A., 4,536,317, Cl. 252-174.170.
Nicolet Instrument Corporation: *See*—
Benson, Robert F., 4,536,239, Cl. 156-64.000.
Nicopoulos, Alex: *See*—
Lapple, Arnulf R.; and Nicopoulos, Alex, 4,536,185, Cl. 8-527.000.
Nielsen, Arnold D., to Ford Motor Company. Solenoid driver with switching during current decay from initial peak current. 4,536,818, Cl. 361-154.000.
Nigorikawa, Kazunori: *See*—
Sugimori, Shigeru; Kojima, Tetsuhiko; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,536,321, Cl. 252-299.630.
Nihon Den-Netsu Keiki Co., Ltd.: *See*—
Kondo, Kenshi, 4,535,722, Cl. 118-692.000.
Nihon Kaiheiki Kogyo Kabushiki Kaisha: *See*—
Ohashi, Shigeo; and Suga, Hiroyuki, 4,535,534, Cl. 29-832.000.
Niida, Sadao: *See*—
Yoshida, Hiroshi; and Niida, Sadao, 4,536,577, Cl. 544-326.000.
Niimura, Shigeru: *See*—
Shigemitsu, Mineo; Maruyama, Ichiyo; and Niimura, Shigeru, 4,536,751, Cl. 340-545.000.
Nikaido, Masataka: *See*—
Kawamoto, Kinji; Tsukamoto, Masao; Murase, Kazuhiro; Kaneaki, Tetsuhiko; and Nikaido, Masataka, 4,536,853, Cl. 364-718.000.
Nike, Inc.: *See*—
Derderian, Thomas; Frederick, Edward C.; and Gross, Alexander L., 4,535,553, Cl. 36-28.000.
Nikku Industry Co., Ltd.: *See*—
Tanaka, Torata, 4,536,359, Cl. 264-102.000.
Nilsson, Kenth, to Siemens Aktiengesellschaft. Piezoelectrically operated print head with channel matrix and method of manufacture. 4,536,097, Cl. 400-126.000.
Nippon Electric Co., Ltd.: *See*—
Kasuya, Yoshihiro, 4,536,881, Cl. 377-70.000.
Tsunoda, Kazuyuki; and Ichikawa, Yoshio, 4,536,761, Cl. 340-825.440.
Utsumi, Kazuaki; Shimada, Yuzo; Suzuki, Masanori; and Takamizawa, Hideo, 4,536,435, Cl. 428-209.000.
Nippon Eurotec Co., Ltd.: *See*—
Wakayama, Toshibumi, 4,535,626, Cl. 73-187.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Yokoshima, Minoru; Nawata, Kazuyoshi; Ohkubo, Tetsuo; and Hattori, Hideaki, 4,536,588, Cl. 549-374.000.
Nippon Light Metal Company, Ltd.: *See*—
Masuda, Takanori; Kakei, Tsutomu; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,536,264, Cl. 204-129.430.
Nippon Paint Co., Ltd.: *See*—
Yamamoto, Yoshikazu; Mizuguchi, Ryuzo; and Yamada, Yasuyuki, 4,536,474, Cl. 435-42.000.
Nippon Soken, Inc.: *See*—
Igashira, Toshihiko; Tanaka, Taro; and Sakakibara, Yasuyuki, 4,535,743, Cl. 123-472.000.
Sato, Susumu; Takeuchi, Yukihisa; and Tomita, Masahiro, 4,535,588, Cl. 60-286.000.
Sowa, Kunihiro, 4,536,656, Cl. 250-463.100.
Yoshida, Hitoshi; Tomita, Masahiro; and Takagi, Shigeru, 4,535,589, Cl. 60-303.000.
Yoshinaga, Toru; Igashira, Toshihiko; Kawai, Hisasi; Morino, Seiji; and Nakamura, Norihiko, 4,535,735, Cl. 123-310.000.
Nippon Steel Corporation: *See*—
Oka, Toshihiro, 4,535,614, Cl. 72-16.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kaneda, Yutaka; and Ohga, Juro, 4,536,887, Cl. 381-92.000.
Nippondenso Co., Ltd.: *See*—
Kanayama, Kenji; and Kinkori, Shuzo, 4,536,672, Cl. 310-268.000.
Nishi, Shinichi: Satoh, Taxey; Shimada, Fumio; and Takahashi, Toshiaki, to Konishiroku Photo Industry Co., Ltd. Optical information recording medium. 4,536,471, Cl. 430-495.000.
Nishikawa, Masao; and Aoki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Automatic transmission and direct coupling clutch for vehicle. 4,535,652, Cl. 74-733.000.
Nishimura, Yukuo, to Canon Kabushiki Kaisha. Display element. 4,536,061, Cl. 350-354.000.
Nishino, Takaichi: *See*—
Sakurada, Kenichi; and Nishino, Takaichi, 4,536,030, Cl. 297-284.000.
Nishizawa, Tsutomu; Tukahara, Ryoichi; Morinaka, Ryoichi; and Hidaka, Tuneo, to Mitsui Toatsu Chemicals, Inc. Nematic liquid crystalline composition. 4,536,320, Cl. 252-299.100.
Nissan Motor Company, Limited: *See*—
Matsumura, Ryouichi, 4,535,744, Cl. 123-493.000.
Mochida, Haruo, 4,536,021, Cl. 292-201.000.
Narita, Ryuhei; Aida, Hiroyuki; and Kamiya, Yoshinori, 4,535,503, Cl. 16-382.000.
Sakurada, Kenichi; and Nishino, Takaichi, 4,536,030, Cl. 297-284.000.
Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, 4,536,171, Cl. 474-28.000.
Nitsuko Limited: *See*—
Hamatani, Fumikazu; and Funabasama, Kouichi, 4,536,619, Cl. 179-84.00R.
Kimijima, Norio; and Kawazoe, Yuzuru, 4,536,615, Cl. 179-81.00B.
Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; Kiyomiya, Yutaka; Nakamura, Toshio; Nakamura, Yoshimi; and Yamaguchi, Masanori, 4,536,483, Cl. 502-20.000.
Niwa, Masatake: *See*—
Maekawa, Yukio; Metabi, Tsuneyo; and Niwa, Masatake, 4,536,071, Cl. 354-400.000.
Niwa, Tomizo: *See*—
Ito, Tatsuo; Oba, Kazunori; Fukuyasu, Harumi; Niwa, Tomizo; Shomura, Takashi; and Kazuno, Yuzo, 4,536,398, Cl. 514-43.000.
NL Industries, Inc.: *See*—
Davis, Mark H.; Meador, Richard A.; and Wisler, Macmillan M., 4,536,713, Cl. 324-324.000.
NLB Corp.: *See*—
Shook, Forrest A., 4,536,635, Cl. 219-83.000.
Noble, Bruce P.: *See*—
Babbitt, Brett A.; Le, Tri C.; and Noble, Bruce P., 4,535,967, Cl. 251-54.000.
Nobuta, Yoshiji, to Mizuno Corporation; and Sharp Kabushiki Kaisha. Apparatus for communication of instructing information. 4,536,739, Cl. 340-323.00R.
Noda, Koshi: *See*—
Nakahara, Teiji; Sakai, Shoji; Noda, Koshi; Fujiwara, Michiaki; and Kubota, Nobunori, 4,535,944, Cl. 242-35.50A.
Nohavica, Dusan: *See*—
Rohlicek, Vojtech; Hruby, Jaroslav; Nohavica, Dusan; Hrdlicka, Jan; Vykouk, Vlastimil; and Kubec, Frantisek, 4,535,784, Cl. 128-735.000.
Nomura, Takeo: *See*—
Shimizu, Masaki; and Nomura, Takeo, 4,536,496, Cl. 514-54.000.
Norcliff Thayer, Inc.: *See*—
Flynn, Robert G.; Pitkin, Courtney G.; and Hileman, Gregory A., 4,536,399, Cl. 514-63.000.
Nordson Corporation: *See*—
Jameson, Calvin R., 4,535,919, Cl. 222-190.000.
Jones, Stephen H., 4,535,582, Cl. 53-52.000.
Regan, Donald J., deceased, 4,535,719, Cl. 118-410.000.
Noren, Jan O.: *See*—
Helgstrand, Åke J. E.; Johansson, Karl N. G.; Misiorny, Alfons; Noren, Jan O.; and Stening, Goran B., 4,536,400, Cl. 514-120.000.
Noritake Co., Ltd.: *See*—
Ishikawa, Tadayuki, 4,536,195, Cl. 51-293.000.
Noritake Diamond Industries Co., Ltd.: *See*—
Ishikawa, Tadayuki, 4,536,195, Cl. 51-293.000.
North American Philips Corporation: *See*—
Deutsch, Emory, 4,536,819, Cl. 361-274.000.
Novation, Inc.: *See*—
Serrano, Arthur L., 4,536,618, Cl. 179-84.00R.
Novopac S.n.c. dei F.lli Salem E. & O.: *See*—
Salem, Emilio, 4,535,886, Cl. 206-205.000.
NSK-Warner K. K.: *See*—
Ono, Katsuyasu, 4,536,011, Cl. 280-808.000.
Nugent, James E., to Water & Industrial Waste Laboratories, Inc. Mobile waste water and sludge treatment for hazardous and non-hazardous fluids. 4,536,286, Cl. 210-202.000.
Numata, Shigeaki: *See*—
Komatsu, Tatsuyoshi; Numata, Shigeaki; Sumino, Toshihiko; Matsuzaki, Katsumi; Narita, Masao; and Hioki, Katsuhiko, 4,536,337, Cl. 260-396.00R.
Nusselder, Frederik B., to Polygram GmbH. Storage cassette for two or more disk-shaped high memory density information carriers. 4,535,888, Cl. 206-444.000.
NWL Transformers: *See*—
Seitz, James P.; and Helmers, Michael, 4,536,659, Cl. 307-41.000.
Nyman, Georg: *See*—
Schindl, Klaus; and Nyman, Georg, 4,536,732, Cl. 335-285.000.
Oba, Kazunori: *See*—
Ito, Tatsuo; Oba, Kazunori; Fukuyasu, Harumi; Niwa, Tomizo; Shomura, Takashi; and Kazuno, Yuzo, 4,536,398, Cl. 514-43.000.
Ober, Stephen H., to EMPI, Inc. Transcutaneous electrode device for cast-covered sites. 4,535,779, Cl. 128-644.000.
Occidental Chemical Corporation: *See*—
Olener, Joel L.; and Walker, Leigh E., 4,536,545, Cl. 525-75.000.
Ochiai, Nobuo; and Tsumagari, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Machine for beveling. 4,535,570, Cl. 51-165.770.
Ochs, Leonard R.; Fletcher, Archibald W.; Weber, Harald; and Naden, David, to Duval Corporation. Metal sulphide extraction. 4,536,214, Cl. 75-101.00R.

Ochsner, Arnold, deceased (by Ochsner, Edith, Administratrix), to Forster-Willi Corporation. Stamping machine. 4,535,617, Cl. 72-307.000.

Ochsner, Edith, Administratrix: *See*—
Ochsner, Arnold, deceased, 4,535,617, Cl. 72-307.000.

O'Connor, Michael C.; and Hann, George W., to Union Carbide Corporation. Tool removable tamper indicating closure. 4,535,904, Cl. 215-215.000.

Oda, Masatsugu: *See*—
Jikihara, Tetsuo; Oda, Masatsugu; Natsume, Bunji; Watanabe, Hisao; and Suzuki, Seiichi, 4,536,209, Cl. 71-96.000.

Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, to Asahi Glass Company Ltd. Cathode having high durability and low hydrogen overvoltage and process for the production thereof. 4,536,259, Cl. 204-35.100.

Oerlikon-Boehringer GmbH: *See*—
Berbalk, Hermann, 4,535,661, Cl. 82-40.00R.
Horsky, Anton; Kuhn, Siegfried; and Voss, Wolf-Dietrich, 4,536,112, Cl. 409-134.000.

Ogahara, Shunji: *See*—
Shirai, Shiro; Ogahara, Shunji; and Kubo, Miyuki, 4,536,749, Cl. 340-525.000.

Ogawa, Hiroyasu; Shigei, Tetsuro; Takahashi, Hayashi; Okabe, Tetuya; and Miyatake, Fumio. Preoxidized fiber and process for producing the same. 4,536,448, Cl. 428-394.000.

Ogawa, Hisashi: *See*—
Matsunami, Muneharu; Tsuge, Hiroshi; Kubota, Tatsushi; and Ogawa, Hisashi, 4,536,010, Cl. 280-802.000.

Ogawa, Kyosuke: *See*—
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,536,459, Cl. 430-57.000.

Ogawa, Yoshinari; and Akagi, Noriyuki, to Teijin Limited. Polyester resin composition. 4,536,531, Cl. 524-135.000.

O'Grady, Thomas M.; Tatterson, David F.; and Coates, Ronald, to Standard Oil Company (Indiana). Shale oil stabilization with a hydrogen donor quench and a hydrogen transfer catalyst. 4,536,277, Cl. 208-11.00R.

O'Grady, Thomas M.: *See*—
Tatterson, David F.; O'Grady, Thomas M.; and Coates, Ronald, 4,536,278, Cl. 208-11.00R.

Oguino, Masanori, to Hitachi, Ltd. Rear projection apparatus. 4,536,056, Cl. 350-128.000.

Ogura, Setsuo: *See*—
Nagumo, Shuzo; Ogura, Setsuo; and Kitamura, Yukinori, 4,536,784, Cl. 357-48.000.

Ohashi, Shigeo; and Suga, Hiroyuki, to Nihon Kaiheiki Kogyo Kabushiki Kaisha. Method of mounting a switch body on a printing wiring board or pancl. 4,535,534, Cl. 29-832.000.

Ohbayashi, Yoshikazu: *See*—
Denda, Masahiko; Sato, Shinichi; Tsubouchi, Natsuro; Kinoshita, Shigeji; and Ohbayashi, Yoshikazu, 4,535,530, Cl. 29-571.000.

Ohga, Juro: *See*—
Kaneda, Yutaka; and Ohga, Juro, 4,536,887, Cl. 381-92.000.

Ohkubo, Tetsuo: *See*—
Yokoshima, Minoru; Nawata, Kazuyoshi; Ohkubo, Tetsuo; and Hattori, Hideaki, 4,536,588, Cl. 549-374.000.

Ohmura, Jukichi: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,536,352, Cl. 260-543.00F.

Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Traversing mechanism. 4,535,642, Cl. 74-58.000.

Ohta, Atsuo: *See*—
Ebihara, Shigeto; Ohta, Atsuo; and Kuwabara, Kunikazu, 4,536,750, Cl. 340-539.000.

Ohtake, Yasuhisa; Tanaka, Hiroshi; and Oka, Koichiro, to Kabushiki Kaisha Toshiba. Method of manufacturing a shadow mask for a color cathode ray tube. 4,536,226, Cl. 148-12.00C.

Ohumi, Takeharu; Kurahashi, Yasuo; Hattori, Kyo; and Sakurai, Kazuhiro, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Electromagnetic solenoid type flow control valve. 4,535,815, Cl. 137-625.480.

Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge. 4,536,812, Cl. 360-133.000.

Oka, Koichiro: *See*—
Ohtake, Yasuhisa; Tanaka, Hiroshi; and Oka, Koichiro, 4,536,226, Cl. 148-12.00C.

Oka, Toshihiro, to Nippon Steel Corporation. Method of gauging and controlling workpiece profile in a rolling mill. 4,535,614, Cl. 72-16.000.

Okabe, Tetuya: *See*—
Ogawa, Hiroyasu; Shigei, Tetsuro; Takahashi, Hayashi; Okabe, Tetuya; and Miyatake, Fumio, 4,536,448, Cl. 428-394.000.

Okamoto, Yukikazu: *See*—
Tagami, Manabu; Urayama, Kenzi; Ooishi, Tadashi; Okamoto, Yukikazu; and Tsuji, Kozo, 4,536,498, Cl. 514-147.000.

Okamura, Hideaki: *See*—
Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, 4,536,369, Cl. 422-65.000.

Okamura, Kazuhiko: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,536,397, Cl. 514-11.000.

Okita, Naoki: *See*—
Hasegawa, Shigekazu; Okita, Naoki; and Machida, Satoshi, 4,535,847, Cl. 172-2.000.

Okitsu, Kiyoshi; and Go, Hiroyouki, to Daicel Chemical Industries, Ltd. Process for manufacturing polyetheresteramide. 4,536,563, Cl. 528-279.000.

Okonogi, Itaru; and Shimoda, Tatsuya, to Kabushiki Kaisha Suwa Seikosha. Columnar crystal permanent magnet and method of preparation. 4,536,233, Cl. 148-101.000.

Okudaira, Tadashi; Tsuboi, Akio; Hama, Yoshihisa; and Hara, Mamoru, to Toyo Boseki Kabushiki Kaisha. Blow-molded multi-ply vessel. 4,535,901, Cl. 215-1.00C.

Okumura, Hiroshi: *See*—
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,536,631, Cl. 219-10.770.

Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, to Sanraku-Ocean Co., Ltd.; and Panlabs, Inc. Antibiotics, neoviridogriseins, and their method of production. 4,536,397, Cl. 514-11.000.

Okutani, Tetsuya, to Takeda Chemical Industries, Ltd. Hexahydrodioxopyrimidines, their production and use. 4,536,504, Cl. 514-270.000.

Olapinski, Hans: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; and Krohn, Ulrich, 4,535,683, Cl. 92-224.000.

Oldfield, Peter M., to Easy Ride, Inc. Back rest cushion. 4,535,495, Cl. 5-432.000.

Olechowski, Jerome R., to Union Camp Corporation. Method of polymerizing rosin. 4,536,333, Cl. 260-99.500.

Olener, Joel L.; and Walker, Leigh E., to Occidental Chemical Corporation. Graft polymers of polymerizable monomers and olefin polymers. 4,536,545, Cl. 525-75.000.

Olsen, John H.; and Mordre, Sigurd C., to Flow Industries, Inc. High pressure liquid piston pump. 4,536,135, Cl. 417-383.000.

Olson, Robert A.; and Ross, Patrick D., to Elxsi. Improved disk file allocation and mapping system utilizing cylinder control blocks and file map having unbalanced tree structure. 4,536,837, Cl. 364-200.000.

Olson, Walter H., to Medtronic, Inc. Stroke volume controlled pacer. 4,535,774, Cl. 128-419.0PG.

Olsson, Ingemar, to ASEA Aktiebolag. Length measuring during rolling up of thin material. 4,535,949, Cl. 242-57.000.

Olympus Optical Co., Ltd.: *See*—
Fujibayashi, Kenji, 4,536,808, Cl. 360-74.200.
Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, 4,536,369, Cl. 422-65.000.
Takayama, Syuichi, 4,535,771, Cl. 128-328.000.

Omark Industries, Inc.: *See*—
Gibson, Duane M.; and Scott, Lewis A., 4,535,667, Cl. 83-830.000.

Omori, Hatsutaro, to Kabushiki Kaisha Ohmori Seisakusho. Spinning type fishing reel with axially adjustable spool. 4,535,953, Cl. 242-84.21R.

Omura, Haruo: *See*—
Kondo, Mitsuru; Iwasaki, Hiroshi; Omura, Haruo; and Kanda, Nobuo, 4,536,220, Cl. 106-21.000.

Onder, Kemal: *See*—
Chen, Augustin T.; Goldwasser, David J.; and Onder, Kemal, 4,536,533, Cl. 524-161.000.

O'Neil, Jack, to Roy & Kiesel. Duck decoy movement apparatus. 4,535,560, Cl. 43-3.000.

Onizuka, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Dielectric fluid for electrical discharge machining. 4,536,633, Cl. 219-69.00D.

Ono, Katsuyasu, to NSK-Warner K. K. Position adjuster for seat belt. 4,536,011, Cl. 280-808.000.

Onoda Construction Materials Co., Ltd.: *See*—
Shimizu, Toshihiko, 4,536,417, Cl. 427-140.000.

Ooishi, Tadashi: *See*—
Tagami, Manabu; Urayama, Kenzi; Ooishi, Tadashi; Okamoto, Yukikazu; and Tsuji, Kozo, 4,536,498, Cl. 514-147.000.

Opprecht, Paul; Weil, Wolfgang; and Kaul, Martin, to Opprecht, Paul. Method and machine for electrical resistance roll seam welding with a single electrode-wire. 4,536,636, Cl. 219-83.000.

Orban, Ivan; and Troxler, Eduard, to Ciba-Geigy Corporation. Process for the preparation of sterically hindered hydroxphenylcarboxylic acid esters. 4,536,593, Cl. 560-75.000.

Orban, Joseph N. Integral tensioner assembly for tensioning, inserting and removing a stud. 4,535,656, Cl. 81-57.380.

Orcon Corporation: *See*—
Greci, John J.; and Hoopengardner, Merle C., 4,536,244, Cl. 156-304.400.

O'Regan, Timothy M.: *See*—
Burkum, Merlin E.; and O'Regan, Timothy M., 4,536,704, Cl. 324-52.000.

Orlando, Salvatore; and Martin, David R., to Dunham-Bush, Inc. Simplified unloader indicator for helical screw rotary compressor. 4,536,130, Cl. 417-63.000.

Orlov, Alexandr V.: *See*—
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.

Oronzio deNora Impianti Elettrochimici S.p.A.: *See*—
deNora, Oronzio; and Spaziante, Placido M., 4,536,263, Cl. 204-98.000.

Osato, Yoichi: *See*—
Kanbe, Junichiro; Shirai, Shigeru; Misumi, Teruo; Saitoh, Keishi; and Osato, Yoichi, 4,536,460, Cl. 430-57.000.
Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,536,459, Cl. 430-57.000.

Osborn, Harley G. Gauge wheel apparatus for a banding sprayer. 4,536,002, Cl. 280-43.180.
Osborne, Anthony, to Kearney-National, Inc. Electric circuit interrupter and associated mounting. 4,536,822, Cl. 361-340.000.
Osinga, Halbe, to U.S. Philips Corporation. Electromagnetic deflection unit and picture tube provided with such a unit. 4,536,729, Cl. 335-210.000.
Osmalov, Jerome S.: *See*—
Irving, Christopher L.; and Osmalov, Jerome S., 4,535,789, Cl. 131-84.100.
Osterlund, Rolf G. L.: *See*—
Bergwitz-Larsen, Carl-Aage; and Osterlund, Rolf G. L., 4,536,495, Cl. 514-54.000.
Osterman, Daniel E., to Pesiri Enterprises, Inc. Lathe tailstock drive attachment. 4,535,660, Cl. 82-31.000.
Otani, Junji; and Hirano, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Intake air heating device for internal combustion engine for motorcycles. 4,535,746, Cl. 123-556.000.
Otani, Masato: *See*—
McManus, Gregory K.; and Otani, Masato, 4,535,552, Cl. 34-236.000.
Otis Engineering Corporation: *See*—
Gano, John C.; and Kohn, Gary A., 4,535,968, Cl. 251-58.000.
Otouma, Hiroshi: *See*—
Oda, Yoshio; Otouma, Hiroshi; and Endoh, Eiji, 4,536,259, Cl. 204-35.100.
Otsap, Ben A.: *See*—
Tiep, Brian L.; Phillips, Robert E.; and Otsap, Ben A., 4,535,767, Cl. 128-207.180.
Otsuka Pharmaceutical Co.: *See*—
Miyazaki, Wasei; Sato, Tsuneo; Nakayama, Yasuo; and Sato, Tadao, 4,536,391, Cl. 424-94.000.
Otto, Fred D.: *See*—
Wanke, Sieghard E.; Rangwala, Huseni A.; Otto, Fred D.; Dalla Lana, Ivo G.; Paterson, Linda M.; and Rolston, John H., 4,536,488, Cl. 502-159.000.
Otto, John B., Jr.; and Paul, James M., to Mobil Oil Corporation. Method for immobilizing contaminants in previously leached ores. 4,536,034, Cl. 299-5.000.
Ottung, Kaj. Valve assembly for the supply of a pressurized gaseous fluid to closed containers. 4,535,806, Cl. 137-493.600.
Owens-Corning Fiberglas Corporation: *See*—
Perkins, Richard A.; Brady, William C.; and Turner, Paul W., 4,536,202, Cl. 65-1.000.
Rinehart, James W.; Gilleland, Frank W.; and Engen, Byron W., 4,535,756, Cl. 126-450.000.
Oy Finn-Aqua Ltd.: *See*—
Huhta-Koivisto, Esko, 4,536,258, Cl. 202-180.000.
Oyama, Kiyotaka; and Harada, Tuneo, to Toyo Soda Manufacturing Co., Ltd. Process for producing a halogen-containing ethylbenzene derivative. 4,536,342, Cl. 260-465.00G.
Ozawa, Kaoru: *See*—
Kasubuchi, Takeshi; Hara, Takeo; and Ozawa, Kaoru, 4,536,804, Cl. 360-4.000.
P.L.G. Research Limited: *See*—
Mercer, Frank B., 4,536,429, Cl. 428-136.000.
Paarmann, James. Alignment tool for piece work. 4,535,979, Cl. 269-45.000.
Paccar Inc.: *See*—
Strong, John R., 4,535,977, Cl. 267-64.150.
Package Machinery Co.: *See*—
Mosher, Oren A.; and Douglas, Ellwood S., 4,535,856, Cl. 177-1.000.
Padden, Timothy J., to S. C. Johnson & Son, Inc. Collapsible foam aerosol hair product. 4,536,390, Cl. 424-47.000.
Page, John L.: *See*—
Brice, John C.; Page, John L.; and Whiffin, Peter A. C., 4,535,720, Cl. 118-415.000.
Palmgren, Karl S., to Regioninvest I Norr AB. Conduit-break valve for a pressure conduit or hose with a surrounding protective conduit or hose. 4,535,804, Cl. 137-458.000.
Pandhandle Industries, Inc.: *See*—
Hidle, Jerry, 4,535,947, Cl. 242-55.200.
Panhke, Klaus-Dieter; and Becker, Wilfried, to Rheinmetall GmbH. Drum magazine for large-caliber ammunition. 4,535,677, Cl. 89-46.000.
Panlabs, Inc.: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,536,397, Cl. 514-11.000.
Paoluccio, John A.; and Paoluccio, Robert, to Paoluccio, John A. Lifesaving device. 4,535,765, Cl. 128-203.110.
Paoluccio, Robert: *See*—
Paoluccio, John A.; and Paoluccio, Robert, 4,535,765, Cl. 128-203.110.
Papadakis, Nicholas; and Kalynchuk, Daniel G., to Diamond Shamrock Chemicals Company. pH and CO_2 sensing device and method of making the same. 4,536,274, Cl. 204-433.000.
Papamichalis, Panos E.; and Doddington, George R., to Texas Instruments Incorporated. LPC pole encoding using reduced spectral shaping polynomial. 4,536,886, Cl. 381-41.000.
Paparizos, Christos; Shout, Robert S.; and Shaw, Wilfrid G., to Standard Oil Company, The. Method of making acetals by catalytic reaction of aldehydes with hydroxyalkanes. 4,536,585, Cl. 549-453.000.
Papuga, Donald M.: *See*—
Matzner, Markus; and Papuga, Donald M., 4,536,543, Cl. 525-68.000.
Matzner, Markus; and Papuga, Donald M., 4,536,544, Cl. 525-68.000.
Paramount Industrial Companies, Inc.: *See*—
Diamonstein, Arthur, 4,535,494, Cl. 5-400.000.
Parker, David A.: *See*—
Collyear, John G.; and Parker, David A., 4,535,682, Cl. 92-153.000.
Parker, Dennis D. Water bed bar. 4,535,496, Cl. 5-451.000.
Parker, Robert P., to RCA Corporation. Additive pulse sampling circuit. 4,536,800, Cl. 358-243.000.
Parker, William H., to Del Norte Technology, Inc. Self monitoring intruder detecting system of noise-cancelling vibration detectors. 4,536,753, Cl. 340-566.000.
Parkinson, Kenneth: *See*—
Kennedy, Peter; and Parkinson, Kenneth, 4,536,449, Cl. 428-408.000.
Parkinson, Truman D.: *See*—
Brubaker, Ronald L.; Tloczynki, James J.; Budzol, Melvin; Ahola, Clifford J.; Boyle, Frederick P.; Parkinson, Truman D.; and Rine, James C., 4,535,941, Cl. 241-21.000.
Parma Corporation: *See*—
Rogers, Walter C., Jr., 4,536,029, Cl. 297-281.000.
Parry, Ian C.: *See*—
Bick, David E.; Flippance, Christopher F.; and Parry, Ian C., 4,535,872, Cl. 188-62.000.
Pasch, John H.: *See*—
Brander, Rita W.; Hammond, John E.; and Pasch, John H., 4,536,406, Cl. 426-104.000.
Pastor, Manuel G., to Recyclene Products, Inc. Solvent recovery apparatus. 4,536,256, Cl. 202-164.000.
Patarcity, Adam J., to Kennecott Corporation. Rubber-backed expansion joint. 4,536,018, Cl. 285-229.000.
Patel, Madhu C.: *See*—
Kruse, Richard M.; Moffett, David J.; Patel, Madhu C.; and Barnes, Ronald L., 4,536,648, Cl. 235-454.000.
Paterson, Linda M.: *See*—
Wanke, Sieghard E.; Rangwala, Huseni A.; Otto, Fred D.; Dalla Lana, Ivo G.; Paterson, Linda M.; and Rolston, John H., 4,536,488, Cl. 502-159.000.
Paul, James M.: *See*—
Otto, John B., Jr.; and Paul, James M., 4,536,034, Cl. 299-5.000.
Paula, M. Fatima M. Two person garment. 4,535,479, Cl. 2-69.500.
Pawelzik, Manfred; Herring, William P.; and Kostorz, Jan R., to Friedrich Grohe Armaturenfabrick GmbH & Co. Lever head for single-lever mixing valves. 4,535,814, Cl. 137-625.170.
Payne, Nicholas S., to Procter & Gamble Company, The. Compositions comprising alkylpolysaccharide detergent surfactant. 4,536,319, Cl. 252-174.170.
PDI, Inc.: *See*—
Haasl, Robert J., 4,536,454, Cl. 428-516.000.
Pearce, Robert C., III, to Zoecon Corporation. Pest control device comprising α-cyano-3-phenoxybenzyl 2-(2-chloro-4-trifluoromethylanilino)-3-methylbutanoate. 4,536,388, Cl. 424-28.000.
Pearson, Bernard A.: *See*—
Bookout, Russell J.; Pearson, Bernard A.; and Jacobs, John W., 4,536,137, Cl. 417-390.000.
Pedersen, Robert H.: *See*—
Gur, David; Herron, John M.; and Pedersen, Robert H., 4,535,780, Cl. 128-659.000.
Peebles, William C., Jr.: *See*—
Wood, Joseph A.; and Peebles, William C., Jr., 4,535,811, Cl. 137-601.000.
Pehler, Rebecca C. C.; Whiteman, James R.; and Witte, Arnold C., Jr., to Texaco Inc. Lithium soap grease additive. 4,536,308, Cl. 252-32.70E.
Peiffer, Dennis G.: *See*—
Lundberg, Robert D.; Peiffer, Dennis G.; and Duvdevani, Ilan, 4,536,539, Cl. 524-521.000.
Pejouhy, Radi, to Texas Instruments Incorporated. Recessed lighting fixture and an insulation detecting protector device therefor. 4,536,817, Cl. 361-105.000.
Pemberton Sintermatic S.A.: *See*—
Treharne, Timothy J., 4,536,228, Cl. 148-6.15R.
Penning, Francis A., to Colorado School of Mines. Device for measuring guide alignment for mine shafts and the like. 4,535,541, Cl. 33-1.00H.
Pennsylvania Scale Company: *See*—
Gard, Eric A.; Kautter, William J., Jr.; and Bartsch, Kenneth E., 4,535,854, Cl. 177-1.000.
Pennwalt Corporation: *See*—
Haines, Paul G., 4,536,492, Cl. 502-216.000.
Shukla, Rahul B.; and Shipman, Douglas L., 4,535,576, Cl. 51-413.000.
Perkin-Elmer Corporation, The: *See*—
Shemwell, David M., 4,536,086, Cl. 356-348.000.
Siebert, Edward T., 4,536,089, Cl. 356-352.000.
Perkins, Richard A.; Brady, William C.; and Turner, Paul W., to Owens-Corning Fiberglas Corporation. Drain bushing. 4,536,202, Cl. 65-1.000.
Perng, Guu. Ventilation system for an enclosed space. 4,535,684, Cl. 98-31.000.
Perry, Steven B., to Keptel, Inc. Remotely-activated switching apparatus. 4,536,617, Cl. 179-81.00R.

Personal Products Co.: *See—*
Holtman, Dennis C., 4,536,432, Cl. 428-171.000.
Peruzzo, Roberto: *See—*
Besson, Duilio; De Marco, Claudio; Peruzzo, Roberto; and Ardit, Giuseppe, 4,535,599, Cl. 62-154.000.
Pesa, Frederick A.; and Haase, Thomas A., to Standard Oil Company (Ohio), The. Selective hydrocarboxylation of propylene to isobutyric acid. 4,536,597, Cl. 562-522.000.
Pesiri Enterprises, Inc.: *See—*
Osterman, Daniel E., 4,535,660, Cl. 82-31.000.
Peska, Jan: *See—*
Loth, Fritz; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,536,217, Cl. 106-122.000.
Peter, Joseph R.: *See—*
Navarro, Luis J.; Peter, Joseph R.; and Blair, Bruce W., 4,536,760, Cl. 340-722.000.
Peters, Bernd: *See—*
Weirich, Walter; and Peters, Bernd, 4,536,017, Cl. 285-26.000.
Peters, Gerald I.: *See—*
Tenser, Adrian; Prizlow, Alfred J.; and Peters, Gerald I., 4,535,577, Cl. 52-221.000.
Peters, Mark C.: *See—*
Thomas, Edward B.; and Peters, Mark C., 4,535,836, Cl. 165-86.000.
Petersen, Fred, to Jastram-Werke GmbH KG, Firma. Rudder rotor for watercraft and floating equipment. 4,535,714, Cl. 114-162.000.
Petraud, Gilles, to Cerimon. Trencher with plural digging wheels having adjustable inclination. 4,535,555, Cl. 37-94.000.
Petrolite Corporation: *See—*
Naiman, Michael I.; and Schield, John A., 4,536,191, Cl. 44-62.000.
Naiman, Michael I.; and Schield, John A., 4,536,551, Cl. 525-334.100.
Petuchowski, Samuel J.: *See—*
Rashleigh, Scott C.; and Petuchowski, Samuel J., 4,536,088, Cl. 356-351.000.
Peugeot Outillage Electrique: *See—*
Roger, Jean, 4,536,688, Cl. 318-490.000.
Pfeifle, Helmut: *See—*
Laufer, Helmut; Pfeifle, Helmut; and Straubel, Max, 4,535,742, Cl. 123-447.000.
Pfenninger, Billy J.; and Stansel, F. Harrison, to Krause Plow Corporation. Wing lift for foldable implements. 4,535,848, Cl. 172-311.000.
Pfizenmaier, Heinz: *See—*
Baum, Helmut; Pfizenmaier, Heinz; Schmidt, Ewald; and Strauss, Franz, 4,536,719, Cl. 331-37.000.
Pfizer Inc.: *See—*
Barth, Wayne E., 4,536,393, Cl. 424-114.000.
Kardys, Joseph A., 4,536,573, Cl. 544-49.000.
Stephens, Charles R., Jr.; and Torres, Anibal, 4,536,396, Cl. 514-2.000.
Welch, Willard M., Jr.; Harbert, Charles A.; Koe, B. Kenneth; and Kraska, Allen R., 4,536,518, Cl. 514-647.000.
Phalen, Thomas E., Jr.: *See—*
Burgoyne, John V.; and Phalen, Thomas E., Jr., 4,535,579, Cl. 52-408.000.
Philip Morris, Inc.: *See—*
Irving, Christopher L.; and Osmalov, Jerome S., 4,535,789, Cl. 131-84.100.
Wheless, Jack C., 4,535,790, Cl. 131-94.000.
Williams, David L.; Southwick, Everett W.; and Houminer, Yoram, 4,535,791, Cl. 131-278.000.
Phillips Petroleum Company: *See—*
Harris, Jesse R., 4,536,196, Cl. 55-16.000.
Hobbs, James W., 4,536,606, Cl. 585-650.000.
Shay, Lucas K., 4,536,407, Cl. 426-250.000.
Phillips, Robert E.: *See—*
Tiep, Brian L.; Phillips, Robert E.; and Otsap, Ben A., 4,535,767, Cl. 128-207.180.
Phillips, Robert R.: *See—*
Lundberg, Robert D.; and Phillips, Robert R., 4,536,547, Cl. 525-186.000.
Physio Technology, Inc.: *See—*
Castel, John C., 4,535,777, Cl. 128-421.000.
Phytogen: *See—*
Anderson, David M., 4,536,475, Cl. 435-172.300.
Piaget, Claude: *See—*
Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, 4,536,679, Cl. 313-541.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
Murata, Yasuzo; and Sato, Hiroshi, 4,536,428, Cl. 428-117.000.
Pioneer Electronic Corporation: *See—*
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takugi, 4,536,811, Cl. 360-96.600.
Kenmostu, Isami; and Isobe, Nobuyuki, 4,536,865, Cl. 369-75.200.
Pipe Line Development Company, The: *See—*
Rogers, Elmer V., Jr., 4,535,822, Cl. 138-99.000.
Pirkle, James C., Jr.; Montagna, Angelo A.; and Ruziska, Philip A., to Exxon Research and Engineering Co. Process for conducting reactions using a circulating magnetically stabilized bed to control reaction temperature profile. 4,536,380, Cl. 423-359.000.
Pirota, Franco, to Saes Getters S.p.A. Getter assembly with an improved means of connecting the antenna mount to the getter material container. 4,536,677, Cl. 313-481.000.
Pitkin, Courtney G.: *See—*
Flynn, Robert G.; Pitkin, Courtney G.; and Hileman, Gregory A., 4,536,399, Cl. 514-63.000.
Pitney Bowes Inc.: *See—*
Bosse, Thomas W., 4,536,651, Cl. 250-231.00R.
Duwel, Edward C., 4,536,850, Cl. 364-550.000.
Plantronics, Inc.: *See—*
Wilson, Donald R., 4,536,888, Cl. 381-106.000.
Plastik-Maschinenbau GmbH & Co., KG: *See—*
Geng, Hans, 4,535,940, Cl. 241-3.000.
Plath, Ernst-Dieter; and Klinger, Dieter, to Sipra Patententwicklungs- und Beteiligungsgesellschaft mbH. Circular knitting machine for producing one-face plush webs. 4,535,608, Cl. 66-9.00R.
Platt Saco Lowell Corporation: *See—*
Glazener, Carey A., 4,535,512, Cl. 19-229.000.
Plessey Overseas Limited: *See—*
Rhodes, Stephen J., 4,536,249, Cl. 156-643.000.
Plonski, Siegfried G.: *See—*
Jones, Addison B.; and Plonski, Siegfried G., 4,536,882, Cl. 378-35.000.
Plummer, Ernest L., to FMC Corporation. Insecticidal [1,1'-biphenyl]-3-ylmethyl esters. 4,536,591, Cl. 560-8.000.
Polaroid Corporation: *See—*
d'Entremont, Alice M.; and Freeman, William T., 4,536,848, Cl. 364-526.000.
Politzer, Anton; and Bertiller, Roland, to Diehl GmbH & Co. Cooling arrangement for the gun barrels of firearms. 4,535,676, Cl. 89-14.100.
Polk, Todd J.; and Morrin, James F., to Cabot Medical Corporation. Ultrasonic medical instrument. 4,535,759, Cl. 128-24.00A.
Pollack, Solomon R.: *See—*
Brighton, Carl T.; and Pollack, Solomon R., 4,535,775, Cl. 128-419.00F.
Pollak, Thomas M.: *See—*
Reed, Cathy J.; and Pollak, Thomas M., 4,536,879, Cl. 372-77.000.
Pollinger, Hans; Saumweber, Eckart; Schorwerth, Mathias; and Wirth, Xaver, to Knorr-Bremse GmbH. Carrier for brake linings for disk brakes having divided lining elements. 4,535,874, Cl. 188-73.100.
Polygram GmbH: *See—*
Nusselder, Frederik B., 4,535,888, Cl. 206-444.000.
Polysar Limited: *See—*
Wunder, Richard H., 4,536,568, Cl. 528-487.000.
Ponjee, Johannes J.; and Melgert, Frederik B., to U.S. Philips Corporation. Matrix and method of manufacturing articles of a synthetic resin by the matrix. 4,536,416, Cl. 427-131.000.
Pons, Robert L.: *See—*
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,535,961, Cl. 248-183.000.
Pont-a-Mousson S.A.: *See—*
Malivoir, Roger; and Mayer, Gilbert, 4,535,882, Cl. 198-425.000.
Popescu, Francine. Alkaline bath for the electrodeposition of bright zinc. 4,536,261, Cl. 204-55.00R.
Porcher, Alain, to Societe Nouvelle Rockall France S.A. Label for the identification of objects and apparatus for using said label. 4,535,557, Cl. 40-300.000.
Porta Systems Corp.: *See—*
Hung, Peter, 4,536,050, Cl. 339-99.00R.
Porter, George Z.: *See—*
Bryan, Darold R.; and Porter, George Z., 4,535,717, Cl. 114-230.000.
Post, Karl-Heinz; and Eich, Otwin, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Throttle valve. 4,535,966, Cl. 251-31.000.
Postma, Pieter, to U.S. Philips Corporation. Electrodeless gas discharge lamp having heat conductor disposed within magnetic core. 4,536,675, Cl. 313-46.000.
Pourrias, Bernard M.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Santamaria, Raphael, 4,536,500, Cl. 514-212.000.
Powell, James E., to Shell Development Company. Trimethyl 6-oxabicyclo[3.2.1]octan-4-ols and 4-ones. 4,536,586, Cl. 549-463.000.
Powell, Philip R. Leather covering grip enhancement. 4,536,413, Cl. 427-11.000.
Powers, Richard, to Accupac, Inc. Method of filling containers with a viscous substance. 4,535,823, Cl. 141-5.000.
PPG Industries Canada, Ltd.: *See—*
Goldsmith, Elmar L., 4,536,418, Cl. 427-213.000.
PPG Industries, Inc.: *See—*
Hsu, Ed C., 4,536,447, Cl. 428-392.000.
Hsu, Edward C.; and Temple, Chester S., 4,536,446, Cl. 428-392.000.
Krumwiede, John F.; Harrell, William C.; Hilliard, William G.; and Harris, James E., 4,536,205, Cl. 65-135.000.
Pradel, Gunter: *See—*
Hoffmann, Jurgen; Pradel, Gunter; and Reulecke, Fritz, 4,536,291, Cl. 210-457.000.
Prentice, Alan L.: *See—*
Allam, Rodney J.; and Prentice, Alan L., 4,535,594, Cl. 60-654.000.
Prescott, Everett J. Adjustable manhole frame and method of construction and installation. 4,536,103, Cl. 404-26.000.
Pressman, David: *See—*
Goulter, Victor H., 4,535,911, Cl. 220-404.000.
Prevorsek, Dusan C.: *See—*
Kavesh, Sheldon; and Prevorsek, Dusan C., 4,536,536, Cl. 524-462.000.
Price, Barry J.: *See—*
Clitherow, John W.; Price, Barry J.; Bradshaw, John; Martin-Smith, Michael; Mackinnon, John W. M.; Judd, Duncan B.; and Hayes, Roger, 4,536,508, Cl. 514-383.000.

Price, John J., Jr.: *See—*
Miller, Ira; Rumbaugh, Robert C.; and Price, John J., Jr., 4,536,663, Cl. 307-355.000.
Price, Michael G.; Zehl, Otis G.; and Bonney, Robert D., to Litton Systems, Inc. Thermal stabilization for an acousto-optic device. 4,536,062, Cl. 350-358.000.
Price, Robert W., to Dow Chemical Company, The. Plug valve. 4,535,803, Cl. 137-375.000.
Prime Computer, Inc.: *See—*
Bahr, Richard G.; and Hogan, Thomas C., 4,536,876, Cl. 370-86.000.
Prine, David W., to Chamberlain Manufacturing Corporation. Method and apparatus for structural monitoring with acoustic emission and using pattern recognition. 4,535,629, Cl. 73-587.000.
Prioretti, Guy. Device for slowing down and stopping machines rolling on rails. 4,535,701, Cl. 104-258.000.
Pristo, Paul J.: *See—*
Fagan, Joseph H.; and Pristo, Paul J., 4,535,937, Cl. 239-206.000.
Prizlow, Alfred J.: *See—*
Tenser, Adrian; Prizlow, Alfred J.; and Peters, Gerald I., 4,535,577, Cl. 52-221.000.
Probe Adventures, Inc.: *See—*
Underwood, Mark R., 4,535,787, Cl. 130-27.00T.
Procter & Gamble Company, The: *See—*
Cook, Thomas E.; and Llenado, Ramon A., 4,536,318, Cl. 252-174.170.
Hardy, Frederick E.; Kitko, David J.; and Cambre, Cushman M., 4,536,314, Cl. 252-102.000.
Llenado, Ramon A.; Mao, Mark H. K.; and Nicholson, Denzel A., 4,536,317, Cl. 252-174.170.
Payne, Nicholas S., 4,536,319, Cl. 252-174.170.
Propane Carburetion Systems, Inc.: *See—*
Batchelor, William H., 4,535,728, Cl. 123-27.0GE.
Prosenbauer, Otto, to Inject Star Pokelmaschinen Gesellschaft m.b.H. Device for severing the meat adhering to bones from these bones. 4,535,504, Cl. 17-1.00G.
Prost, Jean-Louis; and Gross, Daniel, to Battelle Memorial Institute. Method of and apparatus for determining the level of liquid in a vessel. 4,535,627, Cl. 73-290.00B.
Provost, Pierre; and Bedard, Jean T., to Vaqua Pneumatique. Weighing scale for individual wheels of a tandem set of wheels. 4,535,858, Cl. 177-134.000.
Pruneau, Albert, Jr.: *See—*
Gagliardo, John P.; Morse, Donald K.; and Pruneau, Albert, Jr., 4,535,846, Cl. 169-25.000.
Przybysz, John X.: *See—*
Miller, Donald L.; and Przybysz, John X., 4,536,783, Cl. 357-38.000.
PTC Aerospace Inc.: *See—*
Brennan, Edward J., 4,536,027, Cl. 297-124.000.
Puls, Craig, to Holiday Cups, Inc. Cup making apparatus with lubricating means. 4,536,173, Cl. 493-149.000.
Purcell, Robert F.: *See—*
Kayser, Robert B.; and Purcell, Robert F., 4,536,300, Cl. 252-8.55D.
Putkowski, Ladislao W. Press with wedge. 4,535,689, Cl. 100-214.000.
Q & Q Retreading System AB: *See—*
Gripenholt, Ninneh; Berggren, Benny; and Boling, Goran, 4,536,242, Cl. 156-96.000.
Quamco, Inc.: *See—*
McAfee, Jerry D., 4,535,970, Cl. 251-315.000.
Quaranta, Cosimo, to Tubiflex, S.p.a. Fluid conduit system. 4,536,019, Cl. 285-322.000.
Quartronics, Inc.: *See—*
DeNisse, Errol P.; and Ward, Roger W., 4,535,638, Cl. 73-862.590.
Queen's University at Kingston: *See—*
Giles, Alan R.; and Mann, Kenneth G., 4,536,392, Cl. 424-101.000.
Wolfe, Saul; Westlake, Donald; and Jensen, Susan, 4,536,476, Cl. 435-183.000.
Quinn, Harold F. Apparatus for supporting a pipe and pipe snapping tool. 4,535,924, Cl. 225-104.000.
Qume Corporation: *See—*
Robinson, Joseph B., 4,536,867, Cl. 369-282.000.
Rabinowitz, Lewis, to Arnell Inc. Gum massager. 4,535,761, Cl. 128-62.00A.
Rahrig, Douglas B., to B. F. Goodrich Company, The. Glass fiber reinforced vinyl chloride polymer products and process for their preparation. 4,536,360, Cl. 264-142.000.
Raines, Kenneth C., to Burron Medical Inc. Normally closed check valve. 4,535,820, Cl. 137-854.000.
Rak, Stanley F.: *See—*
DeVale, Donald P.; and Rak, Stanley F., 4,536,845, Cl. 364-500.000.
Ramachandran, Pallassanna; and Grand, Paul S., to Colgate Palmolive Co. Perfume-containing carrier having surface-modified particles for laundry composition. 4,536,315, Cl. 252-174.110.
Ramachandran, Pallassanna, to Colgate-Palmolive Co. Fabric softening composition containing surface modified clay. 4,536,316, Cl. 252-174.110.
Ramachandran, Venkataraman, to Ethyl Corporation. Process for preparing alpha-arylacrylonitriles. 4,536,343, Cl. 260-465.00F.
Ramchandani, Chander B.: *See—*
Stoffel, James C.; and Ramchandani, Chander B., 4,536,874, Cl. 370-85.000.
Ramey, Carl; Hill, Royce W.; and Beijen, James H., to Micro Plastics, Inc. Semi-automatic pneumatic expansion rivet gun. 4,535,925, Cl. 227-55.000.
Ramisse, Yves D.; Baboulet, Jean-Pierre C.; Vie, Michel P.; and Malaval, Paul C., to L'Etat Francais. Composition for protection against stray currents and process for using the same. 4,536,327, Cl. 252-511.000.
Ramsey, David L., executor: *See—*
Ace, Marshall E., Jr., deceased; Mattson, Ray W.; and Wittenberg, Mark S., 4,536,162, Cl. 446-102.000.
Rangwala, Huseni A.: *See—*
Wanke, Sieghard E.; Rangwala, Huseni A.; Otto, Fred D.; Dalla Lana, Ivo G.; Paterson, Linda M.; and Rolston, John H., 4,536,488, Cl. 502-159.000.
Rannenberg, George C., to United Technologies Corporation. High efficiency air cycle air conditioning system. 4,535,606, Cl. 62-402.000.
Rashleigh, Scott C.; and Petuchowski, Samuel J. Polarimetric Fabry-Perot sensor. 4,536,088, Cl. 356-351.000.
Rattlingourd, Glen D.; Currie, Robert J.; and Moss, Stanley D., to Sperry Corporation. Bit serial convolutional decoder for VLSI implementation. 4,536,878, Cl. 371-43.000.
Rauter, Jurgen: *See—*
Maurer, Dieter; Rauter, Jurgen; and Dziuba, Peter, 4,536,003, Cl. 280-95.00R.
Ray, Richard C., to AT&T Bell Laboratories. Buck-boost converter with dual-mode control for battery charging. 4,536,696, Cl. 320-21.000.
Raychaudhuri, Dipankar; and Schiff, Leonard N., to RCA Corporation. Distortion reducer for companded analog systems. 4,536,846 Cl. 364-514.000.
Raychem Corporation: *See—*
Toy, Lester T., 4,536,445, Cl. 428-349.000.
Raymond, Gary E. Dispenser means for rolled sheet materials. 4,535,664, Cl. 83-162.000.
Raytheon Company: *See—*
Adlerstein, Michael G., 4,536,469, Cl. 430-314.000.
Fattal, Jean A.; and Roesler, Michael L., 4,536,685, Cl. 318-254.000.
RCA Corporation: *See—*
Babcock, William E., 4,536,684, Cl. 315-411.000.
Dischert, William A., 4,536,238, Cl. 156-64.000.
Faith, Thomas J., Jr., 4,536,223, Cl. 148-1.500.
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Downey, Holmes A., 4,536,170, Cl. 464-80.000.
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Marcoux, Bernard; and Bridon, Jean-Noel, 4,536,506, Cl. 514-342.000.
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Rickert, Milton E., Jr., to General Electric Company. Process and composition for producing permanently water wettable surfaces. 4,536,420, Cl. 427-257.000.
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Mochimaru, Hideaki, 4,535,982, Cl. 271-127.000.
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Riemenschneider, Paul K., III, to Highlight Industries, Inc. Stretch film wrapping device. 4,535,951, Cl. 242-754.000.
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Ringel, Gerhard; and Fencsik, Gabor, to MDS Qantel, Inc. Multiprocessor system with communication controller using poll flags for non-contentious slot reservation. 4,536,838, Cl. 364-200.000.
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Rink, Richard H., to Huron Manufacturing Corporation. Cutting tooth for strip mining apparatus. 4,536,037, Cl. 299-92.000.
Riou, Claude R.; and Fayard, Jean F., to Societe Anonyme: Aussedat-Rey. Thermographic recording compositions. 4,536,219, Cl. 106-21.000.
Ritschel, Werner; Diery, Helmut; and Hille, Martin, to Hoechst Aktiengesellschaft. Bisamides, a process for their preparation and their use. 4,536,339, Cl. 260-404.500.
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Roane, James B. Endodontic instrument. 4,536,159, Cl. 433-224.000.
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Baum, Helmut; Pfizenmaier, Heinz; Schmidt, Ewald; and Strauss, Franz, 4,536,719, Cl. 331-37.000.
Esper, Friedrich J.; and Gohl, Walter, 4,535,487, Cl. 623-22.000.
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Kubach, Hans; Kemmner, Ulrich; and Grimm, Gerold, 4,536,731, Cl. 335-272.000.
Laufer, Helmut; Pfeifle, Helmut; and Straubel, Max, 4,535,742, Cl. 123-447.000.
Roberts, Griffith T. Solar energy collector. 4,535,755, Cl. 126-443.000.
Roberts, Jack; and Johnson, Robert L., to Rensselaer Polytechnic Institute. Low friction bearing surfaces and structures particularly for artificial prosthetic joints. 4,535,486, Cl. 623-22.000.
Roberts, Victor D., to General Electric Company. Resistive lamp ballast with re-ignition circuit. 4,536,680, Cl. 315-49.000.
Robertson, James D. Twist-cam refrigerant dispensing valve. 4,535,802, Cl. 137-322.000.
Robinson, Joseph B., to Qume Corporation. Self-centering disc. 4,536,867, Cl. 369-282.000.
Roca Nierga, Manuel, to SPICA S.p.A. Advance variator for a fuel injection pump. 4,535,745, Cl. 123-502.000.
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Alexander, Robert H., 4,535,850, Cl. 173-12.000.
Jaqua, Vance W., 4,535,518, Cl. 29-157.00C.
Jones, Addison B.; and Plonski, Siegfried G., 4,536,882, Cl. 378-35.000.
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Southwell, William H., 4,536,063, Cl. 350-395.000.
Sprouse, Kenneth M.; Schuman, Merlin D.; and Combs, L. Paul, 4,536,603, Cl. 585-539.000.
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Grimm, Rainer; and Elfen, Adolf, 4,536,829, Cl. 362-74.000.
Rodd, Derek E. Hot water heat distributor. 4,535,934, Cl. 237-70.000.
Roes, John B.; Kelly, Guy M.; Case, Robert F.; and Deming, Chandler R., to Cubic Western Data. Modularized ticket handling system for use in automatic ticket preparation system. 4,535,892, Cl. 209-3.300.
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Roger, Jean, to Peugeot Outillage Electrique. Electric drilling machine. 4,536,688, Cl. 318-490.000.
Rogers, Elmer V., Jr., to Pipe Line Development Company, The. Fitting installation device. 4,535,822, Cl. 138-99.000.
Rogers, Walter C., Jr., to Parma Corporation. Rocking chair. 4,536,029, Cl. 297-281.000.
Rohde, Ralph: *See*—
Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, 4,536,401, Cl. 514-173.000.
Rohlicek, Vojtech; Hruby, Jaroslav; Nohavica, Dusan; Hrdlicka, Jan; Vykouk, Vlastimil; and Kubec, Frantisek, to Ceskoslovenska akademie ved. Apparatus for stimulating acupuncture points by light radiation. 4,535,784, Cl. 128-735.000.
Rohm, Gunter H. Jaw position and/or force detector for power chuck. 4,536,000, Cl. 279-1.00R.
Rohner, Joachim; and Kamp, Heinz, to W. Schlafhorst & Co. Method and device for locating and holding a thread end. 4,535,945, Cl. 242-35.60R.
Rokach, Joshua; Rooney, Clarence S.; and Cragoe, Edward J., Jr., to Merck & Co., Inc.; and Merck Frosst Canada, Inc. Prostaglandin antagonists. 4,536,507, Cl. 514-362.000.
Rollmann, Louis D., to Mobil Oil Corporation. Upgrading heavy crude oils to lighter products with a dispersed zeolite. 4,536,282, Cl. 208-120.000.
Rolston, John H.: *See*—
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Romand-Monnier, Jacques; and Lejeune, Jean-Pierre, to Alsthom-Atlantique. Motor-driven pump assembly which can be used under water. 4,536,138, Cl. 417-422.000.
Romano, Robert P., to Comus International Corp. Multiple pole mercury switch particularly adapted for thermostat applications. 4,536,727, Cl. 335-54.000.
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Rooks, J. F. Girard. Method for treating neuroleptic induced tardive dyskinesia. 4,536,403, Cl. 514-483.000.

Rooney, Clarence S.: *See*—
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Rosaen, Nils O. Automatic shut off valve. 4,535,797, Cl. 137-87.000.
Rosman, Irwin E.; and Wagner, William R., to Rockwell International Corporation. Internally manifolded unibody plate for a plate/fin-type heat exchanger. 4,535,840, Cl. 165-167.000.
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Ross, Richard J., to Baker Oil Tools, Inc. Well tool setting assembly. 4,535,842, Cl. 166-63.000.
Rossmann, Axel; and Merz, Herbert, to Motoren-Und Turbinen-Union. Turbocompressor provided with an abradable coating. 4,536,127, Cl. 415-174.000.
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Rowekamp, Patricia A., to Drackett Company, The. Bottle. 4,535,906, Cl. 215-329.000.
Rowland-Hill, E. William; and Sheehan, Ronald T., to Sperry Corporation. Lateral leveling mechanism for combine cleaning apparatus. 4,535,788, Cl. 130-27.0AE.
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Rumbaugh, Robert C.: *See*—
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Ruth-Larson, Dawn; and Nels, James S., to Kimberly-Clark Corporation. Surgical gown for high fluid procedures. 4,535,481, Cl. 2-114.000.
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Pirkle, James C., Jr.; Montagna, Angelo A.; and Ruziska, Philip A., 4,536,380, Cl. 423-359.000.
Ryan, Thomas D., to Formulabs Industrial Inks, Inc. Overprinting of dye colored poly(vinyl chloride) resins. 4,536,184, Cl. 8-508.000.
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Padden, Timothy J., 4,536,390, Cl. 424-47.000.
Saastamoinen Oy: *See*—
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Sacca, Demetrio B., to General Motors Corporation. Heat exchanger with convoluted air center strip. 4,535,839, Cl. 165-153.000.
Sachse, Burkhard: *See*—
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Saes Getters S.p.A.: *See*—
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Sagi, Zsigmond L.; and Hof, Craig R. Slip resistant absorbent pad. 4,536,433, Cl. 428-195.000.
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Saito, Etsuro, to Sony Corporation. Magnetic disc recording and/or reproducing apparatus. 4,536,813, Cl. 360-137.000.
Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, to Hitachi, Ltd. Apparatus for continuous pressure feeding of slurry. 4,536,131, Cl. 417-102.000.
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Sakakibara, Kenji, to Brother Kogyo Kabushiki Kaisha. Method of controlling a stepping motor. 4,536,691, Cl. 318-696.000.
Sakakibara, Shumpei; Yugari, Yasumi; and Hashimoto, Shigebumi, to Ajinomoto Co., Inc. Amino acid derivatives and antihypertensive drugs containing them. 4,536,395, Cl. 514-7.000.
Sakakibara, Yasuyuki: *See*—
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Sakamoto, Izumi; and Takagi, Kunihiko, to Unitika Ltd. Anti-cancer device. 4,536,387, Cl. 424-14.000.
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Sakka, Kenji, to Hitachi, Ltd. Method of and apparatus for warming high-pressure feed water heaters for power plants. 4,535,593, Cl. 60-646.000.
Sakurada, Kenichi; and Nishino, Takaichi, to Nissan Motor Co., Ltd.; and Tachikawa Spring Company, Limited. Seat with adjustable side support device. 4,536,030, Cl. 297-284.000.
Sakurada, Masahiko; Manabe, Sugio; Okamura, Hideaki; and Gocho, Nagahiro, to Olympus Optical Company Limited. Automatic analyzing apparatus. 4,536,369, Cl. 422-65.000.
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Salem, Emilio, to Novopac S.n.c. dei F.lli Salem E. & O. Flat packs for incoherent products with anti-crushing device. 4,535,886, Cl. 206-205.000.
Samodovitz, Arthur J. Multiple curved transducers providing extended depth of field. 4,535,630, Cl. 73-642.000.
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Martens, Theodorus H. G.; and Sanders, Franciscus H. M., 4,536,415, Cl. 427-40.000.
Sanders, Frederick W., to Mead Corporation, The. Imaging system. 4,536,463, Cl. 430-138.000.
Sanders, Mildred P. Ironing board caddy. 4,535,921, Cl. 223-106.000.
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Hignett, Geoffrey J.; Rowbottom, Kenneth T.; and Sanderson, William R., 4,536,313, Cl. 252-100.000.
Sandhaus, Jeffrey. Closure. 4,535,905, Cl. 215-218.000.
Sandoz, Inc.: *See*—
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Sands, Robert W.; and Bloom, Daniel M., to General Electric Company. R lamp having an improved neck section for increasing the useful light output. 4,536,834, Cl. 362-303.000.
Sandy, Julius W.; Riebock, William D.; and Bauscher, Billy J., to Ex-Cell-O Corporation. Drill bit. 4,536,107, Cl. 408-214.000.
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Sartorius GmbH: *See*—
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Sasaki, Yutaka; Kiyomiya, Yutaka; Nakamura, Toshio; Nakamura, Yoshimi; and Yamaguchi, Masanori, to Nitto Chemical Industry Co., Ltd. Process for regeneration of iron-antimony metallic oxide catalysts. 4,536,483, Cl. 502-20.000.
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Sato, Katsujiro: *See*—
Kodama, Hisashi; Hamamoto, Tooru; Tamura, Tetsuomi; Sato, Katsujiro; and Yamada, Kazuharu, 4,535,734, Cl. 123-90.580.

Sato, Katsunobu: *See*—
Hashimoto, Kiyoyasu; Yoshinaga, Kenji; Mori, Yoshio; Seino, Junzaburo; Kenmochi, Hirohito; and Sato, Katsunobu, 4,536,569, Cl. 534-575.000.

Sato, Shinichi: *See*—
Denda, Masahiko; Sato, Shinichi; Tsubouchi, Natsuro; Kinoshita, Shigeji; and Ohbayashi, Yoshikazu, 4,535,530, Cl. 29-571.000.

Sato, Susumu; Takeuchi, Yukihisa; and Tomita, Masahiro, to Nippon Soken, Inc. Carbon particulates cleaning device for diesel engine. 4,535,588, Cl. 60-286.000.

Sato, Tadao: *See*—
Miyazaki, Wasei; Sato, Tsuneo; Nakayama, Yasuo; and Sato, Tadao, 4,536,391, Cl. 424-94.000.

Sato, Tsuneo: *See*—
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Sato, Yoshimasa: *See*—
Futakuchi, Takashi; Nakamura, Kiyofumi; Sato, Yoshimasa; Tsukuda, Toshio; and Shiraishi, Hiroyuki, 4,536,211, Cl. 75-5.000.

Satoh, Taxey: *See*—
Nishi, Shinichi; Satoh, Taxey; Shimada, Fumio; and Takahashi, Toshiaki, 4,536,471, Cl. 430-495.000.

Sattler, Roland: *See*—
Sterle, Vinko, 4,535,513, Cl. 24-346.000.

Sauer, Gerhard: *See*—
Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, 4,536,401, Cl. 514-173.000.

Saumweber, Eckart: *See*—
Pollinger, Hans; Saumweber, Eckart; Schorwerth, Mathias; and Wirth, Xaver, 4,535,874, Cl. 188-73.100.

Savides, Christos; and Bright, John H., to American Cyanamid Company. Extraction of amino acids from aqueous solution with dithiophosphinates. 4,536,596, Cl. 562-443.000.

Sawayama, Tadahiro: *See*—
Tukamoto, Masatoshi; and Sawayama, Tadahiro, 4,536,601, Cl. 564-355.000.

Sawyer, Robert D.; and Fohl, Michael W., to Tom Sawyer Supply & Equipment. Apparatus for forming an expanded foam form liner including a contoured surface. 4,536,145, Cl. 425-289.000.

Saxton, Robert W.; Hewitt, William R.; and Nelligan, Jerome M., to Federal-Mogul Corporation. Flexible microdrill. 4,536,108, Cl. 408-230.000.

Sbragia, Ronald J.: *See*—
Rigterink, Raymond H.; and Sbragia, Ronald J., 4,536,341, Cl. 260-453.0AR.

Schafer, Karl: *See*—
Schmeer, Gert; Engelmann, Eberhard; and Schafer, Karl, 4,536,441, Cl. 428-317.300.

Schaller, Helmut F. K. Magnetic pickup for stringed instruments. 4,535,668, Cl. 84-1.150.

Schenz, Timothy W.: *See*—
Vaccaro, Nancy J.; Frost, John R.; Glatz, Alfred C.; and Schenz, Timothy W., 4,536,410, Cl. 426-548.000.

Scherer, John R. Device for facilitating removal and insertion of plugs in gas jets in core molding operations. 4,535,520, Cl. 29-235.000.

Schering Aktiengesellschaft: *See*—
Neef, Guenter; Sauer, Gerhard; Wiechert, Rudolf; Hofmeister, Helmut; Rohde, Ralph; Annen, Klaus; Laurent, Henry; Beier, Sybille; Losert, Wolfgang; Elger, Walter; and Henderson, David, 4,536,401, Cl. 514-173.000.

Schield, John A.: *See*—
Naiman, Michael I.; and Schield, John A., 4,536,191, Cl. 44-62.000.
Naiman, Michael I.; and Schield, John A., 4,536,551, Cl. 525-334.100.

Schiess, Wolfgang; and Thorandt, Herbert, to VEB Hochvakuum Dresden. Method and apparatus for the protection of analyzers and other sensitive components from soiling and corrosion. 4,535,633, Cl. 73-706.000.

Schiff, Leonard N.: *See*—
Raychaudhuri, Dipankar; and Schiff, Leonard N., 4,536,846, Cl. 364-514.000.

Schildkraut, Alan L.; and MacAvoy, David W., to Allied Corporation. Anti-decoupling mechanism for an electrical connector assembly. 4,536,048, Cl. 339-89.00M.

Schildkraut, Irwin: *See*—
Bergen, Henry M.; Zaimi, Sedat; Castellano, Vincenzo; and Schildkraut, Irwin, 4,536,621, Cl. 179-99.00R.

Schindel, Arnold; and Higgins, Edward, Jr., to Singer Company, The. Clear view screen. 4,536,064, Cl. 350-583.000.

Schindl, Klaus; and Nyman, Georg, to C. Reichert Optische Werke AG. Magnetic coupling for parts of an optical instrument. 4,536,732, Cl. 335-285.000.

Schlegel Corporation: *See*—
Yackiw, Charles, 4,535,564, Cl. 49-489.000.

Schlosser, Erich J.; and Stephen, James C., to Weber-Stephen Products Co. Portable barbecue grill. 4,535,749, Cl. 126-25.00R.

Schlotzhauer, Kenneth G.: *See*—
Metz, Arthur J.; and Schlotzhauer, Kenneth G., 4,536,666, Cl. 307-494.000.

Schlumberger Technology Corporation: *See*—
Clark, Brian, 4,536,714, Cl. 324-338.000.
Sinha, Bikash K.; and Gouilloud, Michel, 4,535,631, Cl. 73-703.000.
Sinha, Bikash K.; and Gouilloud, Michel, 4,535,632, Cl. 73-703.000.

Schmeer, Gert; Engelmann, Eberhard; and Schafer, Karl, to Beiersdorf Aktiengesellschaft. Adhesive tape. 4,536,441, Cl. 428-317.300.

Schmidt, Ewald: *See*—
Baum, Helmut; Pfizenmaier, Heinz; Schmidt, Ewald; and Strauss, Franz, 4,536,719, Cl. 331-37.000.

Schmidt, Manfred; and Dicke, Hans-Rudolf, to Bayer Aktiengesellschaft. Thermotropic, wholly aromatic polyesters. 4,536,561, Cl. 528-191.000.

Schmidt, Martin; and Hattendorff, Horst D., to Dragerwerk Aktiengesellschaft. Optical multi-beam gas measuring apparatus. 4,536,090, Cl. 356-414.000.

Schmidt, V. Hugo. Piezoelectric wind generator. 4,536,674, Cl. 310-330.000.

Schmitt, Joseph M., to American Cyanamid Company. Treatment of acrylamide and related compounds. 4,536,326, Cl. 252-400.00R.

Schneider, Arthur, to Volkswagenwerk Aktiengesellschaft. Apparatus for obtaining an information on the motion of a moving element, preferably for rotational speed of a rotating element in an automobile. 4,536,708, Cl. 324-174.000.

Schnirch, Leo; and Weyel, Karl-Hermann, to Weyel KG Visuelle Einrichtungen. Mechanism for vertically movably supporting a board member on a wall. 4,536,163, Cl. 434-420.000.

Schockner, Richard C.: *See*—
Thurlow, Norman C.; Hayter, Walter R.; and Schockner, Richard C., 4,536,653, Cl. 250-390.000.

Schoeneberger, Carl F.: *See*—
Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., 4,536,791, Cl. 358-122.000.

Schoenmakers, Wijnand J., to U.S. Philips Corporation. Device for the serial merging of two ordered lists in order to form a single ordered list. 4,536,857, Cl. 364-900.000.

Schonstedt Instrument Company: *See*—
Dunham, Warren D., 4,536,710, Cl. 324-244.000.

Schorwerth, Mathias: *See*—
Pollinger, Hans; Saumweber, Eckart; Schorwerth, Mathias; and Wirth, Xaver, 4,535,874, Cl. 188-73.100.

Schouhamer Immink, Kornelis A., to U.S. Philips Corporation. Method of encoding a stream of data bits, device for carring out the method, and device for decoding a stream of data bits. 4,536,742, Cl. 340-347.0DD.

Schreiber, Max: *See*—
Kuhnis, Ernst; Kobler, Armin; Schreiber, Max; and Wallimann, Hans, 4,535,709, Cl. 112-83.000.

Schubert, Johannes, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Apparatus for supplying liquid mediums to rollers of printing machines utilizing a distributor plate. 4,535,692, Cl. 101-337.000.

Schubert, Paul: *See*—
Fischer, Peter; and Schubert, Paul, 4,535,527, Cl. 29-568.000.

Schuman, Merlin D.: *See*—
Sprouse, Kenneth M.; Schuman, Merlin D.; and Combs, L. Paul, 4,536,603, Cl. 585-539.000.

Schurter AG: *See*—
Wallner, Peter; and Hollenstein, Peter, 4,536,054, Cl. 339-147.00R.

Schutten, Herman P.: *See*—
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,536,884, Cl. 378-119.000.

Schutz, Matthias; Sivers, Rolf V.; Roesems, Dirk; and Rebmann, Rolf, to Dr. Ing. h.c.F. Porsche A.G. Vibration damped suspension for a drive aggregate of a motor vehicle in a body structure. 4,535,964, Cl. 248-607.000.

Schutzle, Gunter: *See*—
Reichardt, Manfred; and Schutzle, Gunter, 4,536,045, Cl. 339-14.00P.

Schweitzer, Edmund O., Jr. Fault indicator with push button reset. 4,536,758, Cl. 340-664.000.

Scott, Kenneth W.: *See*—
Bartok, Stephen; Stansbury, Benjamin H., Jr.; and Backus, Alan L., 4,535,931, Cl. 236-20.00R.

Scott, Lewis A.: *See*—
Gibson, Duane M.; and Scott, Lewis A., 4,535,667, Cl. 83-830.000.

Sea Savory, Inc.: *See*—
Reinke, Theodore S., 4,535,507, Cl. 17-48.000.

Seaborn Development, Inc.: *See*—
Seaborn, Paul E., 4,535,567, Cl. 51-140.000.

Seaborn, Paul E., to Seaborn Development, Inc. Computer magnetic media burnisher. 4,535,567, Cl. 51-140.000.

Seaford, F. Leo, to Wil-Mat Corporation. Molded shock-absorbing wheel assembly. 4,535,827, Cl. 152-7.000.

Sealy, Incorporated: *See*—
Wagner, Robert F., 4,535,978, Cl. 267-91.000.

Seaton, John: *See*—
Shah, Hemen V.; Mashikian, Victor; Seaton, John; and Keller, Gordon, 4,536,839, Cl. 364-200.000.

Sebest, Albert E., to Spectro Industries, Inc. Pillow bed mechanism. 4,535,492, Cl. 5-68.000.

Secom Co., Ltd.: *See—*
Ebihara, Shigeto; Ohta, Atsuo; and Kuwabara, Kunikazu, 4,536,750, Cl. 340-539.000.
Shigemitsu, Mineo; Maruyama, Ichiyo; and Niimura, Shigeru, 4,536,751, Cl. 340-545.000.
Shirai, Shiro; Ogahara, Shunji; and Kubo, Miyuki, 4,536,749, Cl. 340-525.000.
Securicard Systems Limited: *See—*
Boutaleb, Lucy A.; Boutaleb, Aboubekr; and Kerekess, Tibor T., 4,536,014, Cl. 283-83.000.
Seemuth, Paul D., to Ethyl Corporation. Cetane improver composition. 4,536,190, Cl. 44-57.000.
Seidel, Harry W.: *See—*
Remington, John L.; and Seidel, Harry W., 4,535,897, Cl. 211-70.600.
Seidl, Gunther, to Zahnradfabrik Friedrichshafen, AG. Regulatable vane pump. 4,536,133, Cl. 417-307.000.
Seino, Junzaburo: *See—*
Hashimoto, Kiyoyasu; Yoshinaga, Kenji; Mori, Yoshio; Seino, Junzaburo; Kenmochi, Hirohito; and Sato, Katsunobu, 4,536,569, Cl. 534-575.000.
Seitz, James P.; and Helmers, Michael, to NWL Transformers. Visible disconnect/ground switch. 4,536,659, Cl. 307-41.000.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Hayashi, Motoshige; Kobayashi, Toshirou; Yoshii, Motokazu; Tsubone, Masahiro; and Ishikawa, Mikio, 4,536,357, Cl. 264-53.000.
Seltveit, Arne, to Sintef. Diffusion barrier for aluminium electrolysis furnaces. 4,536,273, Cl. 204-243.00R.
Sengoku, Isao: *See—*
Friedman, Harry; Sengoku, Isao; Hattori, Yukiro; and Isikawa, Minoru, 4,535,539, Cl. 30-161.000.
Sentementes, Thomas: *See—*
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Sentrol, Inc.: *See—*
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Seragan Diagnostics, Inc.: *See—*
Sokoloff, Roger L.; and Reno, John M., 4,536,478, Cl. 436-533.000.
Seremet, Louis J. Padlock shield. 4,535,612, Cl. 70-56.000.
Serrano, Arthur L., to Novation, Inc. Telephone line interface. 4,536,618, Cl. 179-84.00R.
Settineri, William J.; Charles, John G.; Hinkel, Jerald J.; and Malone, Bradley P., to Dow Chemical Company, The. Method for removing or retarding paraffin buildup on surfaces in contact with natural gas. 4,536,222, Cl. 134-5.000.
Sevastakis, Gus. Continuous casting apparatus. 4,535,832, Cl. 164-421.000.
Seyferth, Dietmar: *See—*
Fellmann, Jere D.; Garrou, Philip E.; Withers, Howard P., Jr.; and Seyferth, Dietmar, 4,536,589, Cl. 556-14.000.
Seyfried, Philippe: *See—*
Fiori, Robert; Seyfried, Philippe; and Symard, Jose , 4,535,666, Cl. 83-795.000.
Shah, Hemen V.; Mashikian, Victor; Seaton, John; and Keller, Gordon, to MAI Basic Four, Inc. Memory request arbitrator. 4,536,839, Cl. 364-200.000.
Sharp Kabushiki Kaisha: *See—*
Hayakawa, Masao; Maeda, Takamichi; and Kumura, Masao, 4,536,786, Cl. 357-68.000.
Kamuro, Setsufumi, 4,536,859, Cl. 365-154.000.
Kasubuchi, Takeshi; Hara, Takeo; and Ozawa, Kaoru, 4,536,804, Cl. 360-4.000.
Masuda, Sinichi, 4,536,667, Cl. 307-592.000.
Nobuta, Yoshiji, 4,536,739, Cl. 340-323.00R.
Takamatsu, Toshiaki; Funada, Fumiaki; Ishii, Yutaka; and Wada, Tomio, 4,536,060, Cl. 350-343.000.
Shaw, Frank W.: *See—*
Thayer, Timothy Z.; and Shaw, Frank W., 4,536,371, Cl. 422-171.000.
Shaw, Herbert J.; and Bergh, Ralph A., to Leland Stanford Junior University, The Board of Trustees of The. Method of manufacturing a fiber optic directional coupler. 4,536,058, Cl. 350-320.000.
Shaw, Wilfrid G.: *See—*
Paparizos, Christos; Shout, Robert S.; and Shaw, Wilfrid G., 4,536,585, Cl. 549-453.000.
Shay, Lucas K., to Phillips Petroleum Company. Functional protein products. 4,536,407, Cl. 426-250.000.
Shcwaighofer, Roman: *See—*
Mesey, Milton; Shcwaighofer, Roman; and Donner, Meinrad, 4,535,573, Cl. 51-165.870.
Shealy, James B., to Allied Corporation. Apparatus for removing cut staple. 4,535,663, Cl. 83-100.000.
Shearer, Wilfred L.; Sinker, Stephen M.; and Wolf, Richard A., to Celanese Corporation. Poly(butylene terephthalate) based molding resins. 4,536,527, Cl. 524-193.000.
Shedigian, Vandos, to Emhart Industries, Inc. Non-toxic impregnant for electrical capacitors. 4,536,331, Cl. 252-579.000.
Sheehan, Bernard P.; and Werwick, Volker, to NCR Corporation. Self-regulating ribbon re-inking device. 4,536,098, Cl. 400-196.100.
Sheehan, Joseph C. M., to Kells Medical, Incorporated. Skin closure device. 4,535,772, Cl. 128-337.000.
Sheehan, Ronald T.: *See—*
Rowland-Hill, E. William; and Sheehan, Ronald T., 4,535,788, Cl. 130-27.0AE.
Sheingorn, Larry A. Fixation device for eye testing. 4,536,065, Cl. 351-239.000.
Sheldrake, Leonard J.: *See—*
Johnston, Ralph H.; Munden, Curtis D.; and Sheldrake, Leonard J., 4,536,697, Cl. 322-14.000.
Shell Development Company: *See—*
Powell, James E., 4,536,586, Cl. 549-463.000.
Shell, Melvin E. Separator apparatus for peanuts and other seed crops. 4,535,894, Cl. 209-665.000.
Shell Oil Company: *See—*
Blytas, George C., 4,536,381, Cl. 423-437.000.
Blytas, George C., 4,536,382, Cl. 423-437.000.
Drent, Eit, 4,536,354, Cl. 260-549.000.
Klingensmith, G. Bruce; Whitehead, Richard O.; and Higgins, Thair L., 4,536,537, Cl. 524-481.000.
Sanborn, James R., 4,536,497, Cl. 514-112.000.
Shelly, Randolph D., to Sperry Corporation. High frequency inverter transformer for power supplies. 4,536,733, Cl. 336-182.000.
Shemwell, David M., to Perkin-Elmer Corporation, The. Holographic figure sensor. 4,536,086, Cl. 356-348.000.
Shen, John C. S., to International Business Machines Corporation. Rigid magnetic recording media coating composition. 4,536,451, Cl. 428-418.000.
Sheng, Ping; and Bloch, Aaron N., to Exxon Research and Engineering Co. Solar cell with two-dimensional hexagonal reflecting diffraction grating. 4,536,608, Cl. 136-259.000.
Shepherd, Robert G.; and Upeslacis, Janis, to American Cyanamid Company. Aralkanamidophenyl compounds. 4,536,346, Cl. 260-465.00D.
Sheppard, Clyde H.: *See—*
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,536,559, Cl. 528-170.000.
Sherman, Ralph A., II; and Watson, Calvin R., to E-Z P.A.C., Inc. Reusable shipping box with cam tabs for release of closure interlock. 4,535,929, Cl. 229-39.00R.
Shernoff, Donald, to Singer Company, The. Dither compensator for ring laser gyroscope. 4,536,087, Cl. 356-350.000.
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Maka'sky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljuns, Sergei P., to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Po Ochikh Tke Tekhnologichesky Gazov, Stochnykh Vod I Ispolzovaniju Vtorichnykh Energoresursov Predpriyaty Chernoi Metallurgii Vnipichermetenergoochist Ka. Method and apparatus for supplying voltage to high-ohmic dust electrostatic precipitator. 4,536,698, Cl. 323-237.000.
Shiau, David W.; and Smith, Eric, to Borden, Inc. Low formaldehyde emission urea-formaldehyde resins containing a melamine additive. 4,536,245, Cl. 156-307.300.
Shibata, Makoto: *See—*
Ikeda, Masami; Matsuda, Hiroto; Shibata, Makoto; and Takahashi, Hiroto, 4,536,250, Cl. 156-651.000.
Shibuya Kogyo Co., Ltd.: *See—*
Tanaka, Hideo; and Muranaka, Shiaru, 4,535,583, Cl. 53-75.000.
Shibuya, Koji: *See—*
Yoneda, Kiyoshi; Takeuchi, Hiroshi; Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,536,842, Cl. 364-424.000.
Shiga, Mitsuo, to Honda Giken Kogyo Kabushiki Kaisha. Three-wheeled motor vehicle. 4,535,866, Cl. 180-215.000.
Shigei, Tetsuro: *See—*
Ogawa, Hiroyasu; Shigei, Tetsuro; Takahashi, Hayashi; Okabe, Tetuya; and Miyatake, Fumio, 4,536,448, Cl. 428-394.000.
Shigemitsu, Mineo; Maruyama, Ichiyo; and Niimura, Shigeru, to Secom Co., Ltd. System for detecting an alarm. 4,536,751, Cl. 340-545.000.
Shimada, Fumio: *See—*
Nishi, Shinichi; Satoh, Taxey; Shimada, Fumio; and Takahashi, Toshiaki, 4,536,471, Cl. 430-495.000.
Shimada, Haruo: *See—*
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Shimada, Yuzo: *See—*
Utsumi, Kazuaki; Shimada, Yuzo; Suzuki, Masanori; and Takamizawa, Hideo, 4,536,435, Cl. 428-209.000.
Shimiya, Keiji: *See—*
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Shimizu, Etsuo: *See—*
Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, 4,536,436, Cl. 428-212.000.
Shimizu, Masaki; and Nomura, Takeo, to Terumo Kabushiki Kaisha. Polysaccharides N9GI, their preparation and therapeutic compositions containing them. 4,536,496, Cl. 514-54.000.
Shimizu, Toshihiko, to Onoda Construction Materials Co., Ltd. Method for repairing and restoring deteriorated cement-containing inorganic material. 4,536,417, Cl. 427-140.000.
Shimoda, Tatsuya: *See—*
Okonogi, Itaru; and Shimoda, Tatsuya, 4,536,233, Cl. 148-101.000.
Shimokura, Akihiro, to Tokico Ltd. Hydraulic damper of adjustable damping force type. 4,535,877, Cl. 188-319.000.
Shimp, Lawrence A., to FMC Corporation. Process for making sodium tripolyphosphate. 4,536,377, Cl. 423-315.000.

Shimura, Kazuhiro: *See—*
Uehara, Masafumi; Yamazaki, Atsuo; and Shimura, Kazuhiro, 4,536,465, Cl. 430-192.000.

Shinohara, Yoshiki: *See—*
Tsutsumikoshi, Shinobu; Goto, Akira; Murakami, Tsuyoshi; Takasaka, Masao; and Shinohara, Yoshiki, 4,535,869, Cl. 180-311.000.

Shipman, Douglas L.: *See—*
Shukla, Rahul B.; and Shipman, Douglas L., 4,535,576, Cl. 51-413.000.

Shirai, Shigeru: *See—*
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Misumi, Teruo; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Shirai, Shigeru, 4,536,459, Cl. 430-57.000.

Shirai, Shiro; Ogahara, Shunji; and Kubo, Miyuki, to Secom Co., Ltd. Security-ensuring apparatus having an operational guidance function. 4,536,749, Cl. 340-525.000.

Shiraishi, Hiroyuki: *See—*
Futakuchi, Takashi; Nakamura, Kiyofumi; Sato, Yoshimasa; Tsukuda, Toshio; and Shiraishi, Hiroyuki, 4,536,211, Cl. 75-5.000.

Shirey, Richard, to Donn Incorporated. Screw slot runner system. 4,535,580, Cl. 52-484.000.

Shirley, Ian M.: *See—*
Ballard, Denis G. H.; Courtis, Andrew; and Shirley, Ian M., 4,536,555, Cl. 526-295.000.

Shiseido Company Ltd.: *See—*
Nara, Michiko; Yamazaki, Kazunori; and Akiyama, Yasuko, 4,536,405, Cl. 514-781.000.

Shmorgunenko, Nikolai S.: *See—*
Kaluzhsky, Nikolai A.; Badaliants, Khoren A.; Kostin, Ivan M.; Zatulovsky, Isaak A.; Korneev, Valentin I.; Andreev, Vladimir V.; Kuzmin, Boris A.; Sizyakov, Viktor M.; Shmorgunenko, Nikolai S.; Krochevsky, Vladislav A.; and Alexeev, Alexei I., 4,536,216, Cl. 106-38.300.

Shneider, Benjamin L.: *See—*
Winzenburg, Mark L.; Fields, Ellis K.; and Shneider, Benjamin L., 4,536,560, Cl. 528-188.000.

Shoham, Ilan. Cotton drying tower for ginneries. 4,535,510, Cl. 19-0.270.

Shomura, Takashi: *See—*
Ito, Tatsuo; Oba, Kazunori; Fukuyasu, Harumi; Niwa, Tomizo; Shomura, Takashi; and Kazuno, Yuzo, 4,536,398, Cl. 514-43.000.

Shono, Tetsuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Device for adjusting the focusing detecting mechanism of a single-lens reflex camera. 4,536,070, Cl. 354-402.000.

Shook, Forrest A., to NLB Corp. Method and apparatus for cleaning welding electrode wheels with high pressure water. 4,536,635, Cl. 219-83.000.

Shores, William M.: *See—*
Harshbarger, John H.; and Shores, William M., 4,536,793, Cl. 358-150.000.

Shout, Robert S.: *See—*
Paparizos, Christos; Shout, Robert S.; and Shaw, Wilfrid G., 4,536,585, Cl. 549-453.000.

Shukla, Rahul B.; and Shipman, Douglas L., to Pennwalt Corporation. Anti-static process for abrasive jet machining. 4,535,576, Cl. 51-413.000.

Shum, Yick-Mow: *See—*
Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,535,845, Cl. 166-272.000.

Sidman, Michael, to Digital Equipment Corporation. Adaptive misposition correcting method and apparatus for magnetic disk servo system. 4,536,809, Cl. 360-77.000.

Siebert, Edward T., to Perkin-Elmer Corporation, The. Analyzer for coherent radiation. 4,536,089, Cl. 356-352.000.

Siegal, Burton L.: *See—*
Varon, David; Dorner, Steven C.; and Siegal, Burton L., 4,535,525, Cl. 29-463.000.

Siemens Aktiengesellschaft: *See—*
Forster, Alfred, 4,536,673, Cl. 310-327.000.
Grallert, Hans-Joachim, 4,536,880, Cl. 375-30.000.
Hetz, Walter, 4,535,781, Cl. 128-660.000.
Nilsson, Kenth, 4,536,097, Cl. 400-126.000.
Strandberg, Hans G.; and Andersen, Hans, 4,535,776, Cl. 128-419.0PG.
von Pieverling, Klaus, 4,536,763, Cl. 343-9.00R.

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Ingram, Wayne A.; Johnson, Stephen L.; and Coleman, Thomas E., 4,536,823, Cl. 361-355.000.

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Ashworth, Denis H., 4,536,009, Cl. 280-755.000.

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Duve, John P., 4,536,627, Cl. 200-38.00R.
Ketterer, Stanley J., 4,535,711, Cl. 112-199.000.
Schindel, Arnold; and Higgins, Edward, Jr., 4,536,064, Cl. 350-583.000.
Shernoff, Donald, 4,536,087, Cl. 356-350.000.
Szostak, Jan; and Fennesz, Frank, Jr., 4,535,710, Cl. 112-459.000.
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Sintef: *See—*
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Plath, Ernst-Dieter; and Klinger, Dieter, 4,535,608, Cl. 66-9.00R.

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Schutz, Matthias; Sivers, Rolf V.; Roesems, Dirk; and Rebmann, Rolf, 4,535,964, Cl. 248-607.000.

Sizyakov, Viktor M.: *See—*
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Skinner, Robert T. J., to Lucas Industries Public Limited Company. Fuel injection nozzles. 4,535,939, Cl. 239-533.300.

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Slagle, Frederick A. Training device for putting golf balls. 4,535,992, Cl. 273-194.00A.

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Gallas, Gunter A., 4,536,613, Cl. 174-65.00R.

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Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.

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Shiau, David W.; and Smith, Eric, 4,536,245, Cl. 156-307.300.

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Wasserman, Martin A.; and Weichman, Barry M., 4,536,510, Cl. 514-308.000.

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Kroger, Harry; Jillie, Don W.; and Smith, Lawrence N., 4,536,414, Cl. 427-38.000.

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Belsterling, Charles A.; and Soberman, Robert K., 4,536,690, Cl. 318-687.000.

Sobolev, Jury A.: *See—*
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Greco, Claudio; and Biandino, Silvano, 4,536,139, Cl. 417-471.000.
Societe Anonyme: Aussedat-Rey: *See*—
Riou, Claude R.; and Fayard, Jean F., 4,536,219, Cl. 106-21.000.
Societe Nationale Des Poudres et Explosifs: *See*—
Lelu, Andre ; Gonthier, Bruno; Grignon, Jean; and Tauzia, Jean-Michel, 4,536,235, Cl. 149-19.400.
Societe Nationale D'Etude et de Construction de Moteurs D'Aviation: *See*—
Vaerman, Jean F., 4,536,654, Cl. 250-458.100.
Societe Nationale Elf Aquitaine: *See*—
Vio, Lino, 4,536,296, Cl. 252-8.50C.
Societe Nouvelle Rockall France S.A.: *See*—
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Klaschka, John T., 4,535,706, Cl. 110-245.000.
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Son, Adelina J.: *See*—
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Saito, Etsuro, 4,536,813, Cl. 360-137.000.
Soper, Peter H. H.; and Cammack, Andrew S., to Autoflow Engineering Limited. Apparatus for moving a tool in a controlled manner. 4,535,566, Cl. 51-124.00L.
Sord Computer Systems, Inc.: *See*—
Hiroishi, Akihiko, 4,536,856, Cl. 364-900.000.
Sorrells, Frank D., to Coie National Corporation. Mounting apparatus for processing lens blanks. 4,535,575, Cl. 51-216.0LP.
Soulakis, George, to Eldon Industries, Inc. Systems in which one or more objects are supported by vertical standards. 4,535,705, Cl. 108-152.000.
South African Inventions Development Corporation: *See*—
Hourahane, Donald H.; and Strover, Angus E., 4,535,768, Cl. 128-305.100.
Southern Research Institute: *See*—
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., 4,536,575, Cl. 544-279.000.
Southwell, William H., to Rockwell International Corporation. Transmissive phase retarder. 4,536,063, Cl. 350-395.000.
Southwest Microwave: *See*—
Cheal, James; and Fitzsimons, James R., 4,536,752, Cl. 340-554.000.
Southwest Research Institute: *See*—
King, James D.; and Riewerts, Erroll S., 4,536,711, Cl. 324-306.000.
Southwick, Everett W.: *See*—
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Sowa, Kunihiro, to Nippon Soken, Inc. Phosphor indication device. 4,536,656, Cl. 250-463.100.
Spain, Robin L. Solar energy operated irrigation surge valve. 4,535,813, Cl. 137-625.500.
Spaziante, Placido M.: *See*—
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Spears, James E.: *See*—
Fekete, Ferenc; and Spears, James E., 4,536,169, Cl. 446-461.000.
Speca, Anthony N., to National Distillers and Chemical Corporation. Intermetallic compounds of polymeric transition metal oxide alkoxides and catalytic use thereof. 4,536,487, Cl. 502-119.000.
Speca, Anthony N.; and Laib, Roger D., to National Petro Chemicals Corporation. High pore volume, high purity alumina gels containing a chromium catalyst. 4,536,489, Cl. 502-162.000.
Specialty Systems, Inc.: *See*—
Zinsmeyer, Herbert G., 4,535,592, Cl. 60-597.000.
Spector, Donald. Rechargeable sachet. 4,535,935, Cl. 239-34.000.
Spector, George; and Spector, Lesley. Heated glove. 4,535,482, Cl. 2-160.000.
Spector, Lesley: *See*—
Spector, George; and Spector, Lesley, 4,535,482, Cl. 2-160.000.
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Speed Queen Company: *See*—
Fey, Robert M.; Woehler, Harold L.; and Manthei, Philip J., 4,535,610, Cl. 68-3.00R.
Speer, Billy L.: *See*—
Burris, Lee R.; Speer, Billy L.; and Gayer, Melvin D., 4,536,172, Cl. 474-135.000.
Spellman, Gordon B.: *See*—
Weiss, Arnold; Schulten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,536,884, Cl. 378-119.000.
Speranza, George P.: *See*—
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Sperry Corporation: *See*—
Davidson, Dale D., 4,536,689, Cl. 318-565.000.
Kroger, Harry; Jillie, Don W.; and Smith, Lawrence N., 4,536,414, Cl. 427-38.000.
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Rattlingourd, Glen D.; Currie, Robert J.; and Moss, Stanley D., 4,536,878, Cl. 371-43.000.
Rowland-Hill, E. William; and Sheehan, Ronald T., 4,535,788, Cl. 130-27.0AE.
Shelly, Randolph D., 4,536,733, Cl. 336-182.000.
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Sprouse, Kenneth M.; Schuman, Merlin D.; and Combs, L. Paul, to Rockwell International Corporation. Production of acetylene from coal by contact with a combustion gas. 4,536,603, Cl. 585-539.000.
Spruth, Wilhelm G.: *See*—
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Stach, Leonard J., to Velsicol Chemical Corporation. Method of increasing the recoverable sugar from sugar beets. 4,536,210, Cl. 71-118.000.
Staehr, Peter R.: *See*—
Claren, Jan S.; Jeppsson, Jan-Bertil; and Staehr, Peter R., 4,535,635, Cl. 73-756.000.
Stahel, Alwin J., to Drag Specialties, Inc. Anti-slip handlebar grip. 4,535,649, Cl. 74-551.900.
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Hendriks, Ivo G. M.; and Stals, Theo, 4,535,506, Cl. 17-45.000.
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Standard Oil Company, The: *See*—
Burgess, Lester E.; Fox, Karl M.; McGarry, Phillip E.; and Herman, David E., 4,536,372, Cl. 422-187.000.
Coffey, Gerald P., 4,536,566, Cl. 528-363.000.
Paparizos, Christos; Shout, Robert S.; and Shaw, Wilfrid G., 4,536,585, Cl. 549-453.000.
Standard Oil Company (Indiana): *See*—
Jageler, Alfred H., 4,535,843, Cl. 166-250.000.
Millheim, Keith K.; and Warren, Tom M., 4,535,972, Cl. 254-277.000.
O'Grady, Thomas M.; Tatterson, David F.; and Coates, Ronald, 4,536,277, Cl. 208-11.00R.
Tatterson, David F.; O'Grady, Thomas M.; and Coates, Ronald, 4,536,278, Cl. 208-11.00R.
Winzenburg, Mark L.; Fields, Ellis K.; and Shneider, Benjamin L., 4,536,560, Cl. 528-188.000.
Standard Oil Company (Ohio), The: *See*—
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Hunger, Josef; and Neumaier, Anton, 4,536,109, Cl. 408-240.000.
Pesa, Frederick A.; and Haase, Thomas A., 4,536,597, Cl. 562-522.000.
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Standard Telephones and Cables, plc: *See*—
Wheeler, Jennifer M.; and Jackson, Dawn A., 4,536,821, Cl. 361-321.000.
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Stanley Works, The: *See*—
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Stansel, F. Harrison: *See*—
Pfenninger, Billy J.; and Stansel, F. Harrison, 4,535,848, Cl. 172-311.000.
Staudenmaier, Paul: *See*—
Hliboki, Joseph G.; and Staudenmaier, Paul, 4,536,085, Cl. 355-93.000.
Steen, Adam: *See*—
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Stegmaier, Alwain: *See*—
Feder, Meinrad; and Stegmaier, Alwain, 4,535,816, Cl. 137-625.650.
Steiger, Anton, to Sulzer Brothers Limited. Drive for an oscillatory mechanical system. 4,535,817, Cl. 137-625.650.
Steinemann, Max: *See*—
Moser, Franz; and Steinemann, Max, 4,535,697, Cl. 102-468.000.
Stelzer, Jack C.; and Fritsch, Joseph E. Control handle extension. 4,535,648, Cl. 74-544.000.
Stempin, John L.; and Wexell, Dale R., to Corning Glass Works. Spontaneously-formed machinable glass-ceramics. 4,536,452, Cl. 428-433.000.
Stempin, John L.: *See*—
Flannery, James E.; Stempin, John L.; and Wexell, Dale R., 4,536,480, Cl. 501-32.000.
Flannery, James E.; Stempin, John L.; and Wexell, Dale R., 4,536,481, Cl. 501-32.000.
Stendel, Wilhelm: *See*—
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Stephen, James C.: *See*—
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Stephens, Charles R., Jr.; and Torres, Anibal, to Pfizer Inc. Synergistic sweetening compositions. 4,536,396, Cl. 514-2.000.
Stephens, William F., to Mattel, Inc. Toy vehicle playset. 4,536,168, Cl. 446-444.000.
Sterle, Vinko, to Sattler, Roland. Detachable drape clamp. 4,535,513, Cl. 24-346.000.
Stewart, Robert D.; and Gamble, Robert L., to Foster Wheeler Energy Corporation. Divided rotary valve feeder. 4,536,121, Cl. 414-219.000.
Stockel, Richard F.; and Dumas, Philip E. Selenium-containing platinum compound. 4,536,571, Cl. 536-23.000.
Stoffel, James C., to Xerox Corporation. Multi-mode scanner. 4,536,077, Cl. 355-8.000.
Stoffel, James C.; and Ramchandani, Chander B. Bandwidth efficient multipoint data communication system. 4,536,874, Cl. 370-85.000.
Stolfa, Frank: *See*—
White, John B., Jr.; McHarg, Robert E.; and Stolfa, Frank, 4,536,280, Cl. 208-106.000.
Stolle Corporation, The: *See*—
Kaminski, Elton G., 4,536,765, Cl. 343-704.000.
Stopper, Howard R., to Drackett Company, The. Non-flammable aerosol propellant microemulsion system. 4,536,323, Cl. 252-305.000.
Storage Technology Corporation: *See*—
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,536,836, Cl. 364-200.000.
Story, Michael S.: *See*—
Cooks, Graham; Story, Michael S.; Jung, Gerhard; and Dobberstein, Peter, 4,536,652, Cl. 250-281.000.
Story, Robert J.: *See*—
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Stouffer Corporation, The: *See*—
Terauds, Oskar R., 4,535,889, Cl. 206-527.000.
Strain, Don R., to Hydro-Dri Systems, Inc. Moisture control device. 4,536,198, Cl. 55-33.000.
Strandberg, Hans G.; and Andersen, Hans, to Siemens Aktiengesellschaft. Cardiac pacemaker with two unipolar electrodes. 4,535,776, Cl. 128-419.0PG.
Straubel, Max: *See*—
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Strauss, Franz: *See*—
Baum, Helmut; Pfizenmaier, Heinz; Schmidt, Ewald; and Strauss, Franz, 4,536,719, Cl. 331-37.000.
Stromberg, Paul C.; and Luoma, Van A. Stick type drumstick. 4,535,671, Cl. 84-422.00S.
Strong, John R., to Paccar Inc. Apparatus and method for a suspension system. 4,535,977, Cl. 267-64.150.
Strover, Angus E.: *See*—
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Sturges, Fred D., to Borg-Warner Corporation. Control system for controlling the engagement of a pressure-operated actuator. 4,535,879, Cl. 192-52.000.
Stutzel, Bernhard, to Chemische Werke Huels, A.G. Highly transparent, impact-resistant modified polyvinyl chloride molding compositions. 4,536,548, Cl. 525-227.000.
Stypulkowski, Paul H.: *See*—
van den Honert, Christopher; and Stypulkowski, Paul H., 4,535,785, Cl. 128-746.000.
Sucheski, Matthew M.: *See*—
Kandybowski, Steven J.; and Sucheski, Matthew M., 4,536,055, Cl. 339-258.00R.
Suga, Hiroyuki: *See*—
Ohashi, Shigeo; and Suga, Hiroyuki, 4,535,534, Cl. 29-832.000.
Sugimori, Shigeru; Kojima, Tetsuhiko; Goto, Yasuyuki; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, to Chisso Corporation. Fluorobenzene derivatives and liquid crystal compositions containing the same. 4,536,321, Cl. 252-299.630.
Sugimoto, Yukihiro: *See*—
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Sugita, Masao: *See*—
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Iwaoka, Hideto; Fujino, Kenji; Sugiyama, Tadashi; and Matsuura, Hiroyuki, 4,536,712, Cl. 324-309.000.
Sullivan, Lawrence B.; and Lo, Charng-Wen M., to Texas Instruments Incorporated. Seismic cable assembly having improved transducers. 4,536,862, Cl. 367-153.000.
Sulzer Brothers Limited: *See*—
Steiger, Anton, 4,535,817, Cl. 137-625.650.
Ziegler, Georg, 4,535,727, Cl. 122-32.000.
Sumi, Akiyasu; and Kawai, Tohru, to Canon Kabushiki Kaisha. Filter mounting mechanism for an optical assembly. 4,536,057, Cl. 350-318.000.
Sumino, Toshihiko: *See*—
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Sumitomo Chemical Company, Limited: *See*—
Hashimoto, Kiyoyasu; Yoshinaga, Kenji; Mori, Yoshio; Seino, Junzaburo; Kenmochi, Hirohito; and Sato, Katsunobu, 4,536,569, Cl. 534-575.000.
Masuko, Fujio; and Katsura, Tadashi, 4,536,599, Cl. 564-124.000.
Sunagawa, Makoto; Matsumura, Haruki; Inoue, Takaaki; and Hirohashi, Toshiyuki, 4,536,334, Cl. 260-239.00A.
Tagami, Manabu; Urayama, Kenzi; Ooishi, Tadashi; Okamoto, Yukikazu; and Tsuji, Kozo, 4,536,498, Cl. 514-147.000.
Sumitomo Heavy Industries Ltd.: *See*—
Futakuchi, Takashi; Nakamura, Kiyofumi; Sato, Yoshimasa; Tsukuda, Toshio; and Shiraishi, Hiroyuki, 4,536,211, Cl. 75-5.000.
Sumitomo Metal Industries, Ltd.: *See*—
Futakuchi, Takashi; Nakamura, Kiyofumi; Sato, Yoshimasa; Tsukuda, Toshio; and Shiraishi, Hiroyuki, 4,536,211, Cl. 75-5.000.
Sumiya, Kenji; Togawa, Fumio; and Saito, Osamu, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,536,444, Cl. 428-340.000.
Sumrall, Howell M. Impelling mechanism. 4,536,142, Cl. 418-227.000.
Sunagawa, Makoto; Matsumura, Haruki; Inoue, Takaaki; and Hirohashi, Toshiyuki, to Sumitomo Chemical Company, Limited. Preparation of β-lactam derivatives. 4,536,334, Cl. 260-239.00A.
Sundeen, Joseph E.; Haugwitz, Rudiger D.; and Sprague, Peter W., to E. R. Squibb & Sons, Inc. Substituted 4-phenoxy or 4-phenylthio prolines. 4,536,501, Cl. 514-225.000.
Sung, Rodney L., to Texaco Inc. Corrosion inhibitor and motor fuel composition containing the same. 4,536,189, Cl. 44-56.000.
Suppan, Anton, to M.A.N. Maschinenfabrik. Bulk-handling belt conveyor. 4,535,884, Cl. 198-626.000.
Susumu Jatsumura: *See*—
Matsumura, Susumu; Yano, Masao; Sashida, Nobuo; and Yamamoto, Yoshihiko, 4,536,816, Cl. 361-91.000.
Sutter, Robert E. Fireplace shovel assembly for removing and transporting ashes. 4,536,023, Cl. 294-9.000.
Suttles, James M., to Mead Corporation, The. System of shelving. 4,535,704, Cl. 108-108.000.
Sutton, Leroy A., to Zenith Electronics Corporation. Horizontal phase shifter. 4,536,683, Cl. 315-401.000.
Suzuki, Kenji: *See*—
Kitagishi, Nozomu; Suzuki, Kenji; and Sakai, Shinji, 4,536,073, Cl. 354-406.000.
Suzuki, Masanori: *See*—
Utsumi, Kazuaki; Shimada, Yuzo; Suzuki, Masanori; and Takamizawa, Hideo, 4,536,435, Cl. 428-209.000.
Suzuki Motor Company Limited: *See*—
Tsutsumikoshi, Shinobu; Goto, Akira; Murakami, Tsuyoshi; Takasaka, Masao; and Shinohara, Yoshiki, 4,535,869, Cl. 180-311.000.
Suzuki, Nobuyuki: *See*—
Someya, Hiromi; Suzuki, Nobuyuki; and Mizogui, Toyokazu, 4,536,074, Cl. 354-442.000.
Suzuki, Osamu: *See*—
Oishi, Kengo; and Suzuki, Osamu, 4,536,812, Cl. 360-133.000.
Suzuki, Seiichi: *See*—
Jikihara, Tetsuo; Oda, Masatsugu; Natsume, Bunji; Watanabe, Hisao; and Suzuki, Seiichi, 4,536,209, Cl. 71-96.000.
Suzuki, Toshiyasu: *See*—
Kurihara, Norimitsu; Suzuki, Toshiyasu; Iwanaga, Takashi; and Hisadomi, Masaru, 4,535,547, Cl. 33-356.000.
Suzuki, Toshiyuki; Nakamura, Tohru; and Tsutsumi, Hisao, to Kao Soap Co., Ltd. Emulsifying agent and emulsified cosmetics. 4,536,519, Cl. 514-785.000.
Suzuki, Yoshiharu: *See*—
Kida, Koichi; Kawai, Yoshio; Tamura, Yutaka; and Suzuki, Yoshiharu, 4,536,605, Cl. 585-640.000.
Suzuki, Yujiro: *See*—
Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, 4,536,436, Cl. 428-212.000.
Svensson, Erik W., Sr.: *See*—
Varone, Richard B.; and Svensson, Erik W., Sr., 4,536,047, Cl. 339-75.00M.
Svoboda, George: *See*—
Dines, David R.; Svoboda, George; and Workman, Robert G., 4,535,535, Cl. 29-845.000.

Swedo, Raymond J.: *See—*
Malloy, Thomas P.; and Swedo, Raymond J., 4,536,301, Cl. 252-8.55D.

Sweeting, Charles W.: *See—*
Bello, Vincent G.; and Sweeting, Charles W., 4,536,700, Cl. 323-285.000.

Swoboda, Johann: *See—*
Hambrecht, Juergen; Reffert, Rudi W.; Minges, Peter; and Swoboda, Johann, 4,536,567, Cl. 528-486.000.

Sybron Corporation: *See—*
Maizenberg, Leonid I., 4,536,157, Cl. 433-129.000.

Symard, Jose : *See—*
Fiori, Robert; Seyfried, Philippe; and Symard, Jose , 4,535,666, Cl. 83-795.000.

Syntex (U.S.A.) Inc.: *See—*
Nelson, Peter H.; Ringold, Howard J.; Unger, Stefan H.; and Thieme, Thomas R., 4,536,503, Cl. 514-255.000.

Szostak, Jan; and Fennesz, Frank, Jr., to Singer Company, The. Stabilizing arrangement for a sewing machine cam post. 4,535,710, Cl. 112-459.000.

T.A.D. Avanti, Inc.: *See—*
Lyle, Stephen V., 4,536,624, Cl. 179-170.0NC.

Tabata, Yukio: *See—*
Kawanishi, Toshiyuki; and Tabata, Yukio, 4,536,437, Cl. 428-212.000.

Tachikawa Spring Company, Limited: *See—*
Sakurada, Kenichi; and Nishino, Takaichi, 4,536,030, Cl. 297-284.000.

Tagami, Manabu; Urayama, Kenzi; Ooishi, Tadashi; Okamoto, Yukikazu; and Tsuji, Kozo, to Sumitomo Chemical Company, Limited. Fungicidal composition. 4,536,498, Cl. 514-147.000.

Taihei Kinzoku Kogyo Co., Ltd.: *See—*
Maeda, Keikichi; Iijima, Takahiro; and Sato, Eiichi, 4,536,455, Cl. 428-629.000.

Takagi, Kunihiko: *See—*
Sakamoto, Izumi; and Takagi, Kunihiko, 4,536,387, Cl. 424-14.000.

Takagi, Shigeru: *See—*
Yoshida, Hitoshi; Tomita, Masahiro; and Takagi, Shigeru, 4,535,589, Cl. 60-303.000.

Takahashi, Hayashi: *See—*
Ogawa, Hiroyasu; Shigei, Tetsuro; Takahashi, Hayashi; Okabe, Tetuya; and Miyatake, Fumio, 4,536,448, Cl. 428-394.000.

Takahashi, Hiroto: *See—*
Ikeda, Masami; Matsuda, Hiroto; Shibata, Makoto; and Takahashi, Hiroto, 4,536,250, Cl. 156-651.000.

Takahashi, Masahiro: *See—*
Masuda, Takanori; Kakei, Tsutomu; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,536,264, Cl. 204-129.430.

Takahashi, Toshiaki: *See—*
Nishi, Shinichi; Satoh, Taxey; Shimada, Fumio; and Takahashi, Toshiaki, 4,536,471, Cl. 430-495.000.

Takalo, Pasi: *See—*
Kylmanen, Pasi; and Takalo, Pasi, 4,536,120, Cl. 414-173.000.

Takamatsu, Toshiaki; Funada, Fumiaki; Ishii, Yutaka; and Wada, Tomio, to Sharp Kabushiki Kaisha. Seal for dynamic scattering-twisted nematic liquid crystal display. 4,536,060, Cl. 350-343.000.

Takami, Akira, to Mitsubishi Denki Kabushiki Kaisha. Centrifugal spark-advance controlling device. 4,535,737, Cl. 123-420.000.

Takamizawa, Hideo: *See—*
Utsumi, Kazuaki; Shimada, Yuzo; Suzuki, Masanori; and Takamizawa, Hideo, 4,536,435, Cl. 428-209.000.

Takano, Seigo: *See—*
Takiguchi, Kiyoaki; and Takano, Seigo, 4,535,895, Cl. 209-683.000.

Takasaka, Masao: *See—*
Tsutsumikoshi, Shinobu; Goto, Akira; Murakami, Tsuyoshi; Takasaka, Masao; and Shinohara, Yoshiki, 4,535,869, Cl. 180-311.000.

Takayama, Syuichi, to Olympus Optical Co., Ltd. Calculus disintegrating apparatus. 4,535,771, Cl. 128-328.000.

Takayama, Toshio; Ando, Hiromi; and Endou, Mitsuhiro, to Tokico Ltd. Pneumatic servo booster. 4,535,680, Cl. 91-376.00R.

Takeda Chemical Industries, Ltd.: *See—*
Okutani, Tetsuya, 4,536,504, Cl. 514-270.000.

Takeda, Hideo: *See—*
Yoneda, Kiyoshi; Takeuchi, Hiroshi; Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,536,842, Cl. 364-424.000.

Takemura, Kaoru: *See—*
Kubo, Yoshiaki; Takemura, Kaoru; and Kouno, Shuichiro, 4,536,206, Cl. 71-3.000.

Takeuchi, Hiroshi: *See—*
Yoneda, Kiyoshi; Takeuchi, Hiroshi; Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,536,842, Cl. 364-424.000.

Takeuchi, Yukihisa: *See—*
Sato, Susumu; Takeuchi, Yukihisa; and Tomita, Masahiro, 4,535,588, Cl. 60-286.000.

Takiguchi, Kiyoaki; and Takano, Seigo, to Computer Services Corporation. Sorting device. 4,535,895, Cl. 209-683.000.

Talon, Inc.: *See—*
Moertel, George B., 4,536,143, Cl. 425-115.000.

Tam, Man C., to Xerox Corporation. Migration imaging process. 4,536,457, Cl. 430-41.000.

Tamura, Akihiko: *See—*
Motohashi, Mitsuo; Nemoto, Mitsugu; and Tamura, Akihiko, 4,536,082, Cl. 355-3.0SH.

Tamura, Tetsuomi: *See—*
Kodama, Hisashi; Hamamoto, Tooru; Tamura, Tetsuomi; Sato, Katsujiro; and Yamada, Kazuharu, 4,535,734, Cl. 123-90.580.

Tamura, Tooru: *See—*
Ito, Akio; Matsuda, Shunsuke; Murakami, Yoshinobu; and Tamura, Tooru, 4,536,267, Cl. 204-159.230.

Tamura, Yutaka: *See—*
Kida, Koichi; Kawai, Yoshio; Tamura, Yutaka; and Suzuki, Yoshiharu, 4,536,605, Cl. 585-640.000.

Tan, Yoichi: *See—*
Kume, Hiroshi; and Tan, Yoichi, 4,536,875, Cl. 370-85.000.

Tanaka, Hideo; and Muranaka, Shiaru, to Shibuya Kogyo Co., Ltd. Rotary type capping apparatus. 4,535,583, Cl. 53-75.000.

Tanaka, Hideshi, to Victor Company of Japan, Ltd. Heating control device for a thermal ink-transfer type printing apparatus. 4,536,771, Cl. 346-76.0PH.

Tanaka, Hiroshi: *See—*
Ohtake, Yasuhisa; Tanaka, Hiroshi; and Oka, Koichiro, 4,536,226, Cl. 148-12.0OC.

Tanaka, Kiichiro: *See—*
Yoneda, Kiyoshi; Takeuchi, Hiroshi; Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,536,842, Cl. 364-424.000.

Tanaka, Minako: *See—*
Fujiwara, Masami; Fukuda, Hidenori; and Tanaka, Minako, 4,536,324, Cl. 252-311.000.

Tanaka, Minoru: *See—*
Kubota, Hitoshi; Tanaka, Minoru; and Aiuchi, Susumu, 4,536,419, Cl. 427-255.500.

Tanaka, Norio; Miura, Takeo; and Miyata, Jiro, to Honda Giken Kogyo Kabushiki Kaisha. Front leg shield for a motor scooter. 4,536,005, Cl. 280-289.00S.

Tanaka, Taro: *See—*
Igashira, Toshihiko; Tanaka, Taro; and Sakakibara, Yasuyuki, 4,535,743, Cl. 123-472.000.

Tanaka, Torata, to Nikku Industry Co., Ltd. Method of manufacturing carbon electrode. 4,536,359, Cl. 264-102.000.

Tanaka, Yoshikazu; Abo, Keiju; Hirano, Hiroyuki; Kumura, Haruyoshi; Yamamuro, Sigeaki; and Morimoto, Yoshiro, to Nissan Motor Co., Ltd. Method and apparatus for controlling continuously variable transmission. 4,536,171, Cl. 474-28.000.

Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, to Fujitsu Ten Limited; and Toyota Jidosha Kogyo Kabushiki Kaisha. Cruise control system for automotive vehicle. 4,535,864, Cl. 180-177.000.

Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, to Fujitsu Ten Limited; and Toyota Jidosha Kogyo Kabushiki Kaisha. Cruise control system for automotive vehicle. 4,535,865, Cl. 180-177.000.

Taniguchi, Nobuyuki; Ishikawa, Norio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Automatic focus control system. 4,536,072, Cl. 354-403.000.

Tatin, Gerard, to Atochem. Bath and method for the simultaneous desizing and bleaching of fabrics. 4,536,182, Cl. 8-107.000.

Tatterson, David F.; O'Grady, Thomas M.; and Coates, Ronald, to Standard Oil Company (Indiana). Shale oil stabilization with a hydrogen donor quench. 4,536,278, Cl. 208-11.00R.

Tatterson, David F.: *See—*
O'Grady, Thomas M.; Tatterson, David F.; and Coates, Ronald, 4,536,277, Cl. 208-11.00R.

Taura, Mitsuharu; and Mizuno, Toshiaki, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling air-fuel ratio in internal combustion engine. 4,535,736, Cl. 123-344.000.

Tauzia, Jean-Michel: *See—*
Lelu, Andre ; Gonthier, Bruno; Grignon, Jean; and Tauzia, Jean-Michel, 4,536,235, Cl. 149-19.400.

Tayco Developments, Inc.: *See—*
Ebert, Edward A., 4,535,764, Cl. 128-92.00B.
Taylor, Paul H., 4,535,876, Cl. 188-311.000.

Taylor, Frank J. P. Non-electric portable dishwasher. 4,535,795, Cl. 134-93.000.

Taylor, Paul H., to Tayco Developments, Inc. Shock absorber construction. 4,535,876, Cl. 188-311.000.

Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Induction heating cooking apparatus. 4,536,631, Cl. 219-10.770.

Teaneck Graphics Corp.: *See—*
Hliboki, Joseph G.; and Staudenmaier, Paul, 4,536,085, Cl. 355-93.000.

Teche, Andre : *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,536,345, Cl. 260-465.00D.

Technar, Incorporated: *See—*
Diller, Robert W., 4,536,629, Cl. 200-61.45R.

Teepak, Inc.: *See—*
Arnold, Lionel C., 4,536,175, Cl. 493-308.000.
Hendriks, Ivo G. M.; and Stals, Theo, 4,535,506, Cl. 17-45.000.

Teijin Limited: *See—*
Ogawa, Yoshinari; and Akagi, Noriyuki, 4,536,531, Cl. 524-135.000.

Tektronix, Inc.: *See—*
Metz, Arthur J.; and Schlotzhauer, Kenneth G., 4,536,666, Cl. 307-494.000.
Navarro, Luis J.; Peter, Joseph R.; and Blair, Bruce W., 4,536,760, Cl. 340-722.000.

Telefonaktiebolaget LM Ericsson: *See—*
Lahti, Mauritz J. B., 4,536,872, Cl. 370-82.000.
Teljupa, Sergei P.: *See—*
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.
Tempel, Christel: *See—*
Nachbur, Hermann; and Tempel, Christel, 4,536,779, Cl. 346-212.000.
Temple, Carroll G.; Montgomery, John A.; and Elliott, Robert D., to Southern Research Institute. 2-Amino-4(3H)-oxopyrido[2,3-d]pyrimidino. 4,536,575, Cl. 544-279.000.
Temple, Chester S.: *See—*
Hsu, Edward C.; and Temple, Chester S., 4,536,446, Cl. 428-392.000.
Tenney, William L., to London Fog, Inc. Gas compressor. 4,536,132, Cl. 417-237.000.
ten Pierick, Hendrik, to U.S. Philips Corporation. Circuit for generating a deflection current through the field deflection coil of a picture display device. 4,536,682, Cl. 315-387.000.
Tenser, Adrian; Prizlow, Alfred J.; and Peters, Gerald I., to Global Upholstery Company Limited. Office panelling system. 4,535,577, Cl. 52-221.000.
Terauds, Oskar R., to Stouffer Corporation, The. Frozen food package and cover lid. 4,535,889, Cl. 206-527.000.
Terneu, Robert: *See—*
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,536,204, Cl. 65-60.400.
Terrones, Johnny; and Kennard, Walter E. Seismic actuated shut-off valve. 4,535,796, Cl. 137-45.000.
Terumo Kabushiki Kaisha: *See—*
Shimizu, Masaki; and Nomura, Takeo, 4,536,496, Cl. 514-54.000.
Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,536,345, Cl. 260-465.00D.
Tetra Pak International Akteibolag: *See—*
Tsubota, Nobutaka, 4,535,584, Cl. 53-128.000.
Tetras S.A.: *See—*
Hoffman, Lionel B., 4,536,075, Cl. 355-3.0DD.
Tetro, Roland G., to Delaval Turbine Inc. Flexible means for measuring liquid level. 4,536,660, Cl. 307-118.000.
Texaco Inc.: *See—*
Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,535,845, Cl. 166-272.000.
Grigsby, Robert A., Jr.; Speranza, George P.; Brennan, Michael E.; and Yeakey, Ernest L., 4,536,522, Cl. 521-172.000.
Lewis, Paul H., 4,536,486, Cl. 502-74.000.
Lin, Jiang-Jen; and Alexander, David C., 4,536,604, Cl. 585-601.000.
Pehler, Rebecca C. C.; Whiteman, James R.; and Witte, Arnold C., Jr., 4,536,308, Cl. 252-32.70E.
Sung, Rodney L., 4,536,189, Cl. 44-56.000.
Yeakey, Ernest L.; and Watts, Lewis W., Jr., 4,536,600, Cl. 564-153.000.
Texas Instruments Incorporated: *See—*
Andrews, Peter J., 4,536,835, Cl. 363-163.000.
Huse, Horst; and Elmer, Werner, 4,536,738, Cl. 340-146.200.
Martin, Robert C., 4,536,664, Cl. 307-475.000.
Papamichalis, Panos E.; and Doddington, George R., 4,536,886, Cl. 381-41.000.
Pejouhy, Radi, 4,536,817, Cl. 361-105.000.
Sullivan, Lawrence B.; and Lo, Charng-Wen M., 4,536,862, Cl. 367-153.000.
Thalmann, Alfred, to Georg Fischer Aktiengesellschaft. Arrangement for welding together thermoplastic molded members. 4,536,644, Cl. 219-535.000.
Thayer, Timothy Z.; and Shaw, Frank W., to Arvin Industries, Inc. Catalytic converter divider. 4,536,371, Cl. 422-171.000.
Theisen, Peter J.; and Chen, C. Gregory, to Eaton Corporation. D. C. power controller with fuse protection. 4,536,814, Cl. 361-7.000.
Thevenon, Henri. Fixed position machine for coiling down a cable. 4,535,946, Cl. 242-54.00R.
Thieme, Thomas R.: *See—*
Nelson, Peter H.; Ringold, Howard J.; Unger, Stefan H.; and Thieme, Thomas R., 4,536,503, Cl. 514-255.000.
Thomas, Charles L.: *See—*
Little, Victor, Jr.; and Thomas, Charles L., 4,536,152, Cl. 431-159.000.
Thomas, Edward B.; and Peters, Mark C., to Crepaco, Inc. Vertically extending heat exchanger. 4,535,836, Cl. 165-86.000.
Thomsen, Svend E.; and Christensen, Thorkild, to Danfoss A/S. Hydraulic control apparatus for a servo-motor, particularly for vehicle steering. 4,535,678, Cl. 91-29.000.
Thomson-CSF: *See—*
Graindorge, Philippe; and Arditty, Herve , 4,536,861, Cl. 367-149.000.
Kaire, Jean C., 4,536,616, Cl. 179-81.00A.
Lange , Francois; and Cornet, Jean, 4,536,868, Cl. 369-284.000.
Thomson-CSF Broadcast, Inc.: *See—*
Kruger, Robert A.; and Bateman, Wayne, 4,536,790, Cl. 358-111.000.
McMann, Renville H., Jr., 4,536,799, Cl. 358-219.000.
Thomson, Daniel C. Marine door lockset. 4,536,020, Cl. 292-173.000.
Thorandt, Herbert: *See—*
Schiess, Wolfgang; and Thorandt, Herbert, 4,535,633, Cl. 73-706.000.
Thukral, Prem S.: *See—*
Cayless, Richard A.; and Thukral, Prem S., 4,536,225, Cl. 148-6.15R.
Thurlow, Norman C.; Hayter, Walter R.; and Schockner, Richard C., to Westinghouse Electric Corp. Seismic restraint means. 4,536,653, Cl. 250-390.000.
Tiefel, Thomas H.: *See—*
Jin, Sungho; and Tiefel, Thomas H., 4,536,229, Cl. 148-31.550.
Tiep, Brian L.; Phillips, Robert E.; and Otsap, Ben A. Oxygen delivery apparatus. 4,535,767, Cl. 128-207.180.
Tijssen, Jan; and van der Loos, Jozef L. M., to Stamicarbon B.V. Process for the preparation of a copolymer comprising alpha-methylstyrene and acrylonitrile. 4,536,556, Cl. 526-342.000.
Timex Corporation: *See—*
Wuthrich, Paul; Daigle, Lyman R.; and Daddona, Anthony D., 4,536,095, Cl. 368-321.000.
Tloczynski, James J.: *See—*
Brubaker, Ronald L.; Tloczynski, James J.; Budzol, Melvin; Ahola, Clifford J.; Boyle, Frederick P.; Parkinson, Truman D.; and Rine, James C., 4,535,941, Cl. 241-21.000.
Tocom, Inc.: *See—*
Campbell, John G.; Schoeneberger, Carl F.; Bundens, Allan B.; Fogle, Richard M.; and Lemburg, John R., 4,536,791, Cl. 358-122.000.
Tod, Roger J.: *See—*
Bellis, Robert D.; Tod, Timothy W.; and Tod, Roger J., 4,535,794, Cl. 133-8.00E.
Tod, Timothy W.: *See—*
Bellis, Robert D.; Tod, Timothy W.; and Tod, Roger J., 4,535,794, Cl. 133-8.00E.
Togawa, Fumio: *See—*
Sumiya, Kenji; Togawa, Fumio; and Saito, Osamu, 4,536,444, Cl. 428-340.000.
Tokico Ltd.: *See—*
Shimokura, Akihiro, 4,535,877, Cl. 188-319.000.
Takayama, Toshio; Ando, Hiromi; and Endou, Mitsuhiro, 4,535,680, Cl. 91-376.00R.
Tokita, Kiyoshi; Sone, Toshinno; and Nakamura, Michio, to Tokyo Shibaura Denki Kabushiki Kaisha. Cathode-ray tube. 4,535,907, Cl. 220-2.10A.
Tokuhara, Mitsuhiro, to Canon Kabushiki Kaisha. Projection device. 4,536,084, Cl. 355-55.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Tazima, Yoshihisa; Morishima, Masayuki; Okumura, Hiroshi; and Kasahara, Shin-ichi, 4,536,631, Cl. 219-10.770.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Ishida, Tsuyoshi, 4,536,709, Cl. 324-239.000.
Mabuchi, Sadaaki, 4,536,734, Cl. 336-196.000.
Maruyama, Jisaburou; Fukayama, Sumio; Miyake, Masanobu; Watanabe, Yoshimi; and Eguchi, Yoshinori, 4,536,676, Cl. 313-318.000.
Nagano, Katsumi, 4,536,701, Cl. 323-315.000.
Nagano, Katsumi, 4,536,702, Cl. 323-316.000.
Ochiai, Nobuo; and Tsumagari, Takashi, 4,535,570, Cl. 51-165.770.
Tokita, Kiyoshi; Sone, Toshinao; and Nakamura, Michio, 4,535,907, Cl. 220-2.10A.
Yoneda, Kiyoshi; Takeuchi, Hiroshi; Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,536,842, Cl. 364-424.000.
Yoshida, Yoshihiro; and Aoki, Hidehiko, 4,536,716, Cl. 330-69.000.
Tom Sawyer Supply & Equipment: *See—*
Sawyer, Robert D.; and Fohl, Michael W., 4,536,145, Cl. 425-289.000.
Tomashauser, Josef: *See—*
Buchholz, Rainer; Tomashauser, Josef; Zodrow, Rudolf; and Mohn, Hans-Werner, 4,536,247, Cl. 156-477.100.
Tomasson, Tom: *See—*
Brynielsson, Thore; Tomasson, Tom; Ahlberg, Leif; and Johansson, Magnus, 4,536,004, Cl. 280-166.000.
Tomita, Masahiro: *See—*
Sato, Susumu; Takeuchi, Yukihisa; and Tomita, Masahiro, 4,535,588, Cl. 60-286.000.
Yoshida, Hitoshi; Tomita, Masahiro; and Takagi, Shigeru, 4,535,589, Cl. 60-303.000.
Tonello, Marc, to Compagnie Europeenne de Teletransmission C.E.T.T. Process for protecting a remote monitoring system against sabotage and a system using this process. 4,536,748, Cl. 340-506.000.
Toon, Michael B., to Mobil Oil Corporation. Gas chromatograph for reseparating a sampel into pure components. 4,536,199, Cl. 55-67.000.
Topits, John. Push peg game apparatus. 4,535,993, Cl. 273-241.000.
Topp-Jorgensen, Jorgen, to Haldor Topsoe A/S. Process for the preparation of catalysts for use in ether synthesis. 4,536,485, Cl. 502-62.000.
Torkelson, John; and Sanders, Weldon A., Jr., to BancTec, Inc. Video data compression system and method. 4,536,801, Cl. 358-280.000.
Torobin, Leonard B. Method for producing plastic microfilaments. 4,536,361, Cl. 264-167.000.
Torres, Anibal: *See—*
Stephens, Charles R., Jr.; and Torres, Anibal, 4,536,396, Cl. 514-2.000.
Torrington Company, The: *See—*
De Bisschop, James; Neri, Anthony A.; and Williams, Thomas J., 4,535,645, Cl. 74-492.000.

Toux, Jacques: *See—*
Gervais, Alain; Vermeire, Daniel; Cerf, Olivier; and Toux, Jacques, 4,535,621, Cl. 73-59.000.
Toy, Lester T., to Raychem Corporation. Elastomer based adhesive compositions. 4,536,445, Cl. 428-349.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Okudaira, Tadashi; Tsuboi, Akio; Hama, Yoshihisa; and Hara, Mamoru, 4,535,901, Cl. 215-1.00C.
Toyo Seikan Kaisha, Ltd.: *See—*
Imatani, Tsuneo; Yasumuro, Hisakazu; Watanabe, Michio; Kurashima, Hideo; and Ishibashi, Kazuhisa, 4,536,243, Cl. 156-274.600.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Oyama, Kiyotaka; and Harada, Tuneo, 4,536,342, Cl. 260-465.00G.
Toyoda, Kazuhiro; and Shimada, Haruo, to Fujitsu Limited. Random access memory device. 4,536,860, Cl. 365-190.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Ohumi, Takeharu; Kurahashi, Yasuo; Hattori, Kyo; and Sakurai, Kazuhiro, 4,535,815, Cl. 137-625.480.
Taura, Mitsuharu; and Mizuno, Toshiaki, 4,535,736, Cl. 123-344.000.
Yamawaki, Takesi, deceased; Kusuhara, Masakazu; and Saitou, Tatuya, 4,536,025, Cl. 296-37.160.
Yoshinaga, Toru; Igashira, Toshihiko; Kawai, Hisasi; Morino, Seiji; and Nakamura, Norihiko, 4,535,735, Cl. 123-310.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Matsunami, Muneharu; Tsuge, Hiroshi; Kubota, Tatsushi; and Ogawa, Hisashi, 4,536,010, Cl. 280-802.000.
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,535,864, Cl. 180-177.000.
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Travis, E. Clayton. Wall ornament for shower and bathtub enclosures. 4,536,423, Cl. 428-14.000.
Trede, Brian E.: *See—*
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,536,836, Cl. 364-200.000.
Treharne, Timothy J., to Pemberton Sintermatic S.A. Corrosion inhibition in sintered stainless steel. 4,536,228, Cl. 148-6.15R.
Trewhella, Joseph M., to Multiplex Company, Inc. Dispensing apparatus. 4,535,917, Cl. 222-129.100.
Trilogy Computer Development Partners, Ltd.: *See—*
Herrmann, John M.; and Voisin, Suzanne M., 4,536,122, Cl. 414-404.000.
Troup, Leon M. Apparatus for applying lap sealant. 4,535,920, Cl. 222-612.000.
Troutman, Samuel J., Jr.; and Hixenbaugh, D. Wayne, to Dynatech Frontier Corporation. Manometer. 4,535,634, Cl. 73-747.000.
Troxler, Eduard: *See—*
Orban, Ivan; and Troxler, Eduard, 4,536,593, Cl. 560-75.000.
Trummlitz, Gunter: *See—*
Engel, Wolfhard; Bauer, Eckhart; Trummlitz, Gunter; Danneberg, Peter; and Kahling, Joachim, 4,536,402, Cl. 514-443.000.
Trush, Vladimir I.: *See—*
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.
Trutzschler GmbH & Co. KG: *See—*
Hosel, Fritz, 4,536,852, Cl. 364-562.000.
Leifeld, Ferdinand; and Hosel, Fritz, 4,535,511, Cl. 19-105.000.
TRW Inc.: *See—*
Bookout, Russell J.; Pearson, Bernard A.; and Jacobs, John W., 4,536,137, Cl. 417-390.000.
Tsai, Boh C.: *See—*
Farrell, Christopher J.; and Tsai, Boh C., 4,536,409, Cl. 426-398.000.
Tsuboi, Akio: *See—*
Okudaira, Tadashi; Tsuboi, Akio; Hama, Yoshihisa; and Hara, Mamoru, 4,535,901, Cl. 215-1.00C.
Tsubone, Masahiro: *See—*
Hayashi, Motoshige; Kobayashi, Toshirou; Yoshii, Motokazu; Tsubone, Masahiro; and Ishikawa, Mikio, 4,536,357, Cl. 264-53.000.
Tsubota, Nobutaka, to Tetra Pak International Akteibolag. Device for bonding an article to a commodity. 4,535,584, Cl. 53-128.000.
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Denda, Masahiko; Sato, Shinichi; Tsubouchi, Natsuro; Kinoshita, Shigeji; and Ohbayashi, Yoshikazu, 4,535,530, Cl. 29-571.000.
Tsuge, Hiroshi: *See—*
Matsunami, Muneharu; Tsuge, Hiroshi; Kubota, Tatsushi; and Ogawa, Hisashi, 4,536,010, Cl. 280-802.000.
Tsuji, Kozo: *See—*
Tagami, Manabu; Urayama, Kenzi; Ooishi, Tadashi; Okamoto, Yukikazu; and Tsuji, Kozo, 4,536,498, Cl. 514-147.000.
Tsukamoto, Masao: *See—*
Kawamoto, Kinji; Tsukamoto, Masao; Murase, Kazuhiro; Kaneaki, Tetsuhiko; and Nikaido, Masataka, 4,536,853, Cl. 364-718.000.
Tsukuda, Toshio: *See—*
Futakuchi, Takashi; Nakamura, Kiyofumi; Sato, Yoshimasa; Tsukuda, Toshio; and Shiraishi, Hiroyuki, 4,536,211, Cl. 75-5.000.
Tsumagari, Takashi: *See—*
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Tsunoda, Kazuyuki; and Ichikawa, Yoshio, to Nippon Electric Co., Ltd. Radio paging receiver having display control means. 4,536,761, Cl. 340-825.440.
Tsutsumi, Hisao: *See—*
Suzuki, Toshiyuki; Nakamura, Tohru; and Tsutsumi, Hisao, 4,536,519, Cl. 514-785.000.
Tsutsumikoshi, Shinobu; Goto, Akira; Murakami, Tsuyoshi; Takasaka, Masao; and Shinohara, Yoshiki, to Suzuki Motor Company Limited. Saddle riding type motorcar having four wheels. 4,535,869, Cl. 180-311.000.
Tubiflex, S.p.a.: *See—*
Quaranta, Cosimo, 4,536,019, Cl. 285-322.000.
Tucker, Donna L.: *See—*
Jones, Mary A.; and Tucker, Donna L., 4,536,028, Cl. 297-224.000.
Tukahara, Ryoichi: *See—*
Nishizawa, Tsutomu; Tukahara, Ryoichi; Morinaka, Ryoichi; and Hidaka, Tuneo, 4,536,320, Cl. 252-299.100.
Tukamoto, Masatoshi; and Sawayama, Tadahiro, to Dainippon Pharmaceutical Co., Ltd. Optically active N-substituted phenylalaninols and use thereof. 4,536,601, Cl. 564-355.000.
Turna, Osman: *See—*
Albrecht, Johannes; Jakobs, Rudolf; Turna, Osman; Vierrath, Helmut; Weil, Manfred; and Zapke, Klaus, 4,536,193, Cl. 48-77.000.
Turner, James A., to Dow Chemical Company, The. Certain naphthyridine diether compounds and their herbicidal use. 4,536,208, Cl. 71-94.000.
Turner, Norman L., to Varian Associates, Inc. Method and apparatus for controlling thermal transfer in a cyclic vacuum processing system. 4,535,834, Cl. 165-80.00R.
Turner, Paul W.: *See—*
Perkins, Richard A.; Brady, William C.; and Turner, Paul W., 4,536,202, Cl. 65-1.000.
Tyszkiewicz, Theodore J.: *See—*
Boden, Richard M.; Hanna, Marie R.; and Tyszkiewicz, Theodore J., 4,536,330, Cl. 252-522.00R.
Ube Industries, Ltd.: *See—*
Yoshida, Hiroshi; and Niida, Sadao, 4,536,577, Cl. 544-326.000.
Uchida, Kenji: *See—*
Saito, Makoto; Sakamoto, Masakatsu; Uchida, Kenji; and Kamino, Yukishige, 4,536,131, Cl. 417-102.000.
Uchikoshi, Gohji, to Nakamichi Corporation. Method of converting a digital signal into an analog signal and a digital-to-analog converter therefor. 4,536,743, Cl. 340-347.0DA.
Uehara, Masafumi; Yamazaki, Atsuo; and Shimura, Kazuhiro, to Konishiroku Photo Industry Co., Ltd. Positive-working photosensitive composition with o-quinone diazide and admixture of resins. 4,536,465, Cl. 430-192.000.
Ueno, Kouji, to Fujitsu Limited. Junction short-circuiting-type programmable read-only memory device. 4,536,858, Cl. 365-104.000.
Umeda, Hiroyuki, to Victor Company of Japan, Ltd. Adapter for a miniature type tape cassette. 4,536,810, Cl. 360-94.000.
Umnyashkin, Vladimir A.: *See—*
Kosolapov, Gennady M.; Revin, Alexandr A.; Komarov, Jury Y.; Umnyashkin, Vladimir A.; Kondrashkin, Alexandr S.; and Sobolev, Jury A., 4,536,041, Cl. 303-119.000.
Underhill, Michael J., to U.S. Philips Corporation. Jitter reduction circuit for frequency synthesizer. 4,536,718, Cl. 331-16.000.
Underwood, Mark R., to Probe Adventures, Inc. Axial flow combine. 4,535,787, Cl. 130-27.00T.
Unger, Stefan H.: *See—*
Nelson, Peter H.; Ringold, Howard J.; Unger, Stefan H.; and Thieme, Thomas R., 4,536,503, Cl. 514-255.000.
Uni-Cardan Aktiengesellschaft: *See—*
Krude, Werner, 4,536,038, Cl. 301-124.00R.
Union Camp Corporation: *See—*
Olechowski, Jerome R., 4,536,333, Cl. 260-99.500.
Union Carbide Corporation: *See—*
Aceto, Roger, 4,535,508, Cl. 17-49.000.
Amstutz, Gary A.; and Mayekar, Kishor D., 4,536,322, Cl. 252-301.160.
Evans, William P., 4,536,456, Cl. 429-194.000.
Matzner, Markus; and Papuga, Donald M., 4,536,543, Cl. 525-68.000.
Matzner, Markus; and Papuga, Donald M., 4,536,544, Cl. 525-68.000.
O'Connor, Michael C.; and Hann, George W., 4,535,904, Cl. 215-215.000.
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Kennedy, Peter; and Parkinson, Kenneth, 4,536,449, Cl. 428-408.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Brittanic Majesty's Government of the: *See—*
Bishop, Sarah M.; and Curtis, Paul T., 4,536,438, Cl. 428-246.000.
United States of America
Agriculture: *See—*
Harper, Robert J., Jr., 4,536,422, Cl. 427-381.000.
Air Force: *See—*
Eylon, Daniel; and Froes, Francis H., 4,536,234, Cl. 148-133.000.
Ludington, Charlotte E., 4,536,658, Cl. 250-578.000.
Army: *See—*
Dubowicz, Palemon W., 4,536,768, Cl. 343-736.000.

McDonald, Joseph K.; and Merritt, James A., 4,536,252, Cl. 156-662.000.
Yuen, Harvard, 4,535,698, Cl. 102-529.000.
Energy: *See*—
Bianchini, Gregory M.; and McRae, Thomas G., 4,535,639, Cl. 73-863.110.
Chapline, George F., Jr., 4,536,883, Cl. 378-36.000.
Huffman, Lester H.; and Knoke, Gerald S., 4,536,035, Cl. 299-17.000.
Kramer, Daniel P., 4,536,203, Cl. 65-29.000.
Waechter, David A.; Erkkila, Bruce H.; and Vasilik, Dennis G., 4,536,841, Cl. 364-414.000.
Health & Human Services: *See*—
Antonucci, Joseph M., 4,536,523, Cl. 523-115.000.
National Aeronautics and Space Administration: *See*—
Belew, Robert R., 4,536,114, Cl. 410-156.000.
Blackburn, Linda B.; and Ellingsworth, John R., 4,535,636, Cl. 73-831.000.
Mikroyannidis, John A., 4,536,565, Cl. 528-352.000.
U.S. Philips Corporation: *See*—
Brice, John C.; Page, John L.; and Whiffin, Peter A. C., 4,535,720, Cl. 118-415.000.
Brice, John C.; and Brough, Colin R., 4,536,227, Cl. 148-13.100.
Guittard, Pierre; Guillemet, Bernard; and Piaget, Claude, 4,536,679, Cl. 313-541.000.
Ijntema, Johannes, 4,536,757, Cl. 340-636.000.
Jochems, Pieter J. W., 4,535,529, Cl. 29-571.000.
Martens, Theodorus H. G.; and Sanders, Franciscus H. M., 4,536,415, Cl. 427-40.000.
Osinga, Halbe, 4,536,729, Cl. 335-210.000.
Ponjee, Johannes J.; and Melgert, Frederik B., 4,536,416, Cl. 427-131.000.
Postma, Pieter, 4,536,675, Cl. 313-46.000.
Schoenmakers, Wijnand J., 4,536,857, Cl. 364-900.000.
Schouhamer Immink, Kornelis A., 4,536,742, Cl. 340-347.0DD.
ten Pierick, Hendrik, 4,536,682, Cl. 315-387.000.
Underhill, Michael J., 4,536,718, Cl. 331-16.000.
van den Berk, Theodorus H. M., 4,536,059, Cl. 350-333.000.
Van Rosmalen, Gerard E., 4,536,864, Cl. 369-44.000.
United States Steel Corporation: *See*—
Boggs, William E.; and Keener, Everett L., 4,536,194, Cl. 48-180.100.
Kachik, Robert H., 4,536,237, Cl. 149-37.000.
United Technologies Corporation: *See*—
Bello, Vincent G.; and Sweeting, Charles W., 4,536,700, Cl. 323-285.000.
Jankot, Alan L., 4,536,129, Cl. 416-95.000.
Rannenberg, George C., 4,535,606, Cl. 62-402.000.
Unitika Ltd.: *See*—
Murase, Shigemitsu, 4,536,526, Cl. 523-433.000.
Sakamoto, Izumi; and Takagi, Kunihiko, 4,536,387, Cl. 424-14.000.
Unitrode Corporation: *See*—
van Dyk Soerewyn, Herman F., 4,536,825, Cl. 361-386.000.
University of Guelph: *See*—
Cocivera, Michael, 4,536,260, Cl. 204-37.100.
University of Minnesota: *See*—
Anderson, Michael H.; Lyons, Christopher S.; and Wigness, Bruce D., 4,536,179, Cl. 604-266.000.
University of Utah: *See*—
Kim, Wan S.; Jeong, Seo Y.; and McRea, James C., 4,536,572, Cl. 536-179.000.
University Patents, Inc.: *See*—
Garito, Anthony F., 4,536,450, Cl. 428-411.100.
Uno, Hiroshi: *See*—
Ishii, Takahito; Yamashita, Kazuo; and Uno, Hiroshi, 4,535,837, Cl. 165-104.170.
UOP Inc.: *See*—
Carson, Don B., 4,536,276, Cl. 208-100.000.
Malloy, Thomas P.; and Swedo, Raymond J., 4,536,301, Cl. 252-8.55D.
Welsh, Lawrence B.; and Leyerle, Richard W., 4,536,358, Cl. 264-81.000.
White, John B., Jr.; McHarg, Robert E.; and Stolfa, Frank, 4,536,280, Cl. 208-106.000.
Upeslacis, Janis: *See*—
Shepherd, Robert G.; and Upeslacis, Janis, 4,536,346, Cl. 260-465.00D.
Upjohn Company, The: *See*—
Chen, Augustin T.; Goldwasser, David J.; and Onder, Kemal, 4,536,533, Cl. 524-161.000.
Regelman, Dale F., 4,536,490, Cl. 502-167.000.
Urayama, Kenzi: *See*—
Tagami, Manabu; Urayama, Kenzi; Ooishi, Tadashi; Okamoto, Yukikazu; and Tsuji, Kozo, 4,536,498, Cl. 514-147.000.
Urban, Martin: *See*—
Zerfass, Karl C.; and Urban, Martin, 4,535,526, Cl. 29-469.500.
Urban, Warren J.; Barillo, Joseph; and Krupa, Jerry J., to Lever Brothers Company. Process for manufacture of fatty acid esters of hydroxy sulfonates. 4,536,338, Cl. 260-400.000.
Usala, Hugo R., to Du Pont de Nemours, E. I., and Company. Castable ceramic compositions. 4,536,535, Cl. 524-403.000.
Utsumi, Kazuaki; Shimada, Yuzo; Suzuki, Masanori; and Takamizawa, Hideo, to Nippon Electric Co., Ltd. Multilayer substrate including layers of an alumina and borosilicate-lead-glass ceramic material. 4,536,435, Cl. 428-209.000.
Vaccaro, Nancy J.; Frost, John R.; Glatz, Alfred C.; and Schenz, Timothy W., to General Foods Corporation. Dipeptide sweetener composition. 4,536,410, Cl. 426-548.000.
Vaerman, Jean F., to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation. Device for detecting flaws on a piece. 4,536,654, Cl. 250-458.100.
Van Cauter, Albert: *See*—
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, 4,536,204, Cl. 65-60.400.
van den Berk, Theodorus H. M., to U.S. Philips Corporation. Liquid crystal display device with ridges. 4,536,059, Cl. 350-333.000.
van den Honert, Christopher; and Stypulkowski, Paul H., to Minnesota Mining and Manufacturing Co. Method and apparatus for determining the viability and survival of sensori-neutral elements within the inner ear. 4,535,785, Cl. 128-746.000.
van der Lely, Cornelis. Vehicle. 4,535,859, Cl. 180-15.000.
van der Loos, Jozef L. M.: *See*—
Tijssen, Jan; and van der Loos, Jozef L. M., 4,536,556, Cl. 526-342.000.
Vander-Mallie, Ronald, to Du Pont de Nemours, E. I., and Company. Use of anti-idiotype antibodies in immunoassays. 4,536,479, Cl. 436-537.000.
van der Scheer, Derk, to Hazemeijer B.V. Current limiting high voltage fuse assembly. 4,536,735, Cl. 337-159.000.
van Dyk Soerewyn, Herman F., to Unitrode Corporation. Leadframe having severable fingers for aligning one or more electronic circuit device components. 4,536,825, Cl. 361-386.000.
Van Laethem, Robert; Van Cauter, Albert; and Terneu, Robert, to Glaverbel. Process for producing coated flat glass. 4,536,204, Cl. 65-60.400.
Van Loveren, Augustinus G.: *See*—
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Van Peteghem, Willy F.: *See*—
De Schamphelaere, Lucien A.; De Cock, Etienne M.; De Bondt, Werner E.; Librecht, Freddy M.; Boeve, Gerard J.; and Van Peteghem, Willy F., 4,536,778, Cl. 346-160.000.
van Roon, Johannes. Layout of a ship steering-house. 4,535,713, Cl. 114-71.000.
Van Rosmalen, Gerard E., to U.S. Philips Corporation. Apparatus for reading an optically coded disc-shaped record carrier. 4,536,864, Cl. 369-44.000.
Van Swaaij, Willibrordus P. M.: *See*—
Groeneveld, Michiel J.; Verver, Albert B.; and Van Swaaij, Willibrordus P. M., 4,535,551, Cl. 34-170.000.
Vaqua Pneumatique: *See*—
Provost, Pierre; and Bedard, Jean T., 4,535,858, Cl. 177-134.000.
Varco International, Inc.: *See*—
Boyadjieff, George I.; and Krasnov, Igor, 4,535,852, Cl. 175-170.000.
Varian Associates, Inc.: *See*—
Holden, Scott C., 4,535,835, Cl. 165-80.00R.
Turner, Norman L., 4,535,834, Cl. 165-80.00R.
Varon, David; Dorner, Steven C.; and Siegal, Burton L., to Crown Metal Mfg. Company. Adapter for bracket securement to wall studs and method of manufacture. 4,535,525, Cl. 29-463.000.
Varone, Richard B.; and Svensson, Erik W., Sr. Communications connector support bracket. 4,536,047, Cl. 339-75.00M.
Vasilik, Dennis G.: *See*—
Waechter, David A.; Erkkila, Bruce H.; and Vasilik, Dennis G., 4,536,841, Cl. 364-414.000.
Veatch, Michael W.: *See*—
Cauthron, Grover L.; and Veatch, Michael W., 4,535,726, Cl. 119-159.000.
VEB Hochvakuum Dresden: *See*—
Schiess, Wolfgang; and Thorandt, Herbert, 4,535,633, Cl. 73-706.000.
Velsicol Chemical Corporation: *See*—
Stach, Leonard J., 4,536,210, Cl. 71-118.000.
Vereschagin, Igor P.: *See*—
Shevalenko, Ilya S.; Ilchenko, Anatoly V.; Trush, Vladimir I.; Vulis, Mikhail L.; Baryshnikov, Anatoly I.; Vereschagin, Igor P.; Makalsky, Leonid M.; Mirzabekian, Garri Z.; Smirnov, Vladimir A.; Dzigan, Viktor P.; Ginzburg, Vladimir E.; Miroshnik, Vladimir I.; Minaev, Alexandr S.; Orlov, Alexandr V.; and Teljupa, Sergei P., 4,536,698, Cl. 323-237.000.
Verhagen, Laurentius A. M.: *See*—
Kirton, Douglas C.; MacNeili, Avril B.; and Verhagen, Laurentius A. M., 4,536,411, Cl. 426-603.000.
Vermeire, Daniel: *See*—
Gervais, Alain; Vermeire, Daniel; Cerf, Olivier; and Toux, Jacques, 4,535,621, Cl. 73-59.000.
Vernay Laboratories, Inc.: *See*—
Atkinson, Gordon E.; and Kubina, Stephen J., 4,535,819, Cl. 137-846.000.
Duncan, Richard K.; and Russell, Norton A., 4,535,818, Cl. 137-846.000.
VerPlanck, James A., to Aeroquip Corporation. Socketing machine hose pull. 4,535,521, Cl. 29-235.000.
Ver Strate, Gay: *See*—
Agarwal, Pawan K.; Lundberg, Robert D.; Graessley, William W.; and Ver Strate, Gay, 4,536,310, Cl. 252-33.000.
Verton, Jose ; and Henrion, Alain, to Champion Spark Plug S.A. Connecting device for wiper blades. 4,535,500, Cl. 15-250.230.

Verver, Albert B.: *See—*
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Victor Company of Japan, Ltd.: *See—*
Hirota, Akira; Miyahara, Hiroyuki; and Kosaka, Yoshiteru, 4,536,795, Cl. 358-160.000.
Kato, Hiroshi; and Kubota, Hiromitsu, 4,536,807, Cl. 360-72.300.
Tanaka, Hideshi, 4,536,771, Cl. 346-76.0PH.
Umeda, Hiroyuki, 4,536,810, Cl. 360-94.000.
Videonics of Hawaii, Inc.: *See—*
Jerome, Jonathan A.; Neu, Frank D.; and Wohlmut, Peter G., 4,536,866, Cl. 369-112.000.
Vie, Michel P.: *See—*
Ramisse, Yves D.; Baboulet, Jean-Pierre C.; Vie, Michel P.; and Malaval, Paul C., 4,536,327, Cl. 252-511.000.
Vierrath, Helmut: *See—*
Albrecht, Johannes; Jakobs, Rudolf; Turna, Osman; Vierrath, Helmut; Weil, Manfred; and Zapke, Klaus, 4,536,193, Cl. 48-77.000.
Viglietti, John E.: *See—*
Garton, Robert E., Jr.; and Viglietti, John E., 4,536,154, Cl. 433-8.000.
Vinding, Jorgen P., to Magnetic Peripherals. Doublet detector for data recording or transmission. 4,536,740, Cl. 340-347.0DD.
Vinekar, Sanjay R.: *See—*
Fernsler, Ronald E.; and Vinekar, Sanjay R., 4,536,794, Cl. 358-158.000.
Vio, Lino, to Societe Nationale Elf Aquitaine. Drilling and completion muds useful at elevated temperatures. 4,536,296, Cl. 252-8.50C.
Visual Information Institute, Inc.: *See—*
Harshbarger, John H., 4,536,792, Cl. 358-139.000.
Harshbarger, John H.; and Shores, William M., 4,536,793, Cl. 358-150.000.
Vock, Manfred H.: *See—*
Mookherjee, Braja D.; Chant, Bernard J.; Evers, William J.; Wilson, Richard A.; Zampino, Michael J.; and Vock, Manfred H., 4,536,583, Cl. 549-1.000.
Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., 4,536,299, Cl. 252-8.600.
Voest-Alpine Aktiengesellschaft: *See—*
Wolkenstein, Robert, 4,536,289, Cl. 210-401.000.
Voisin, Suzanne M.: *See—*
Herrmann, John M.; and Voisin, Suzanne M., 4,536,122, Cl. 414-404.000.
Volkswagenwerk Aktiengesellschaft: *See—*
Schneider, Arthur, 4,536,708, Cl. 324-174.000.
von Beckmann, Helmuth, to Canron Inc. Device for tamping railroad track adjacent the tie ends thereof. 4,535,700, Cl. 104-12.000.
von Pieverling, Klaus, to Siemens Aktiengesellschaft. On-board orientation device for aircraft. 4,536,763, Cl. 343-9.00R.
Voss, Wolf-Dietrich: *See—*
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Sherman, Ralph A., II; and Watson, Calvin R., 4,535,929, Cl. 229-39.00R.
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Miller, Donald L.; and Przybysz, John X., 4,536,783, Cl. 357-38.000.
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Wheless, Jack C., to Philip Morris Incorporated. Method and apparatus for aligning oval cigarette filters. 4,535,790, Cl. 131-94.000.
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White, Edward A. Phosphate fertilizer production. 4,536,378, Cl. 423-321.00R.
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Wiegers, Wilhelmus J.; Van Loveren, Augustinus G.; Hanna, Marie R.; Luccarelli, Domenick, Jr.; Bowen, David R.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Perfuming with a macrocyclic carbonate. 4,536,299, Cl. 252-8.600.
Wiesmann, Harold J. Photovoltaic tandem cell. 4,536,607, Cl. 136-249.000.
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Wildi, Edwin; Bossart, Erwin; and Hasler, Hans, to Maschinenfabrik Benninger AG. Thread braking mechanism. 4,535,956, Cl. 242-151.000.
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Feller, Murray F., 4,535,637, Cl. 73-861.770.
Willhaus, Werner, to International Standard Electric Corporation. Pushbutton switch assembly with integrated lock-down switch. 4,536,628, Cl. 200-43.080.
Williams, David L.; Southwick, Everett W.; and Houminer, Yoram, to Philip Morris Incorporated. Smoking compositions containing acylpyrazine ether flavorants. 4,535,791, Cl. 131-278.000.
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Wilmes, Manfred, to C. A. Weidmuller GmbH & Co. Cutting connector. 4,536,049, Cl. 339-97.00R.
Wilson, Donald R., to Plantronics, Inc. Voice communication instrument system with line-powered receiver conditioning circuit. 4,536,888, Cl. 381-106.000.
Wilson, Larry R.: *See*—
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Winn, Ray, to Advanced Semiconductor Products, Inc. Method of forming thin optical membranes. 4,536,240, Cl. 156-74.000.
Winterhalter, Walter, to Gebruder Junghans GmbH. Fuse for a spin-type projectile. 4,535,695, Cl. 102-240.000.
Winzenburg, Mark L.; Fields, Ellis K.; and Shneider, Benjamin L., to Standard Oil Company (Indiana). Polyimides prepared from cyclic dianhydrides. 4,536,560, Cl. 528-188.000.

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Wisniewski, Gregory G. Reflector assembly for lamp fixtures. 4,536,830, Cl. 362-223.000.

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Wolf, Richard A.: *See*—
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Wolfe, Saul; Westlake, Donald; and Jensen, Susan, to Queen's University at Kingston. Stable epimerase reagent, cyclase reagent and ring expansion reagent for cell-free production of cephalosporins. 4,536,476, Cl. 435-183.000.

Wolkenstein, Robert, to Voest-Alpine Aktiengesellschaft. Filter press for dewatering of materials. 4,536,289, Cl. 210-401.000.

Woo, Edmund P., to Dow Chemical Company, The. Polyamide from bis-carboxy containing 3,5,3',5'-tetraoxo-1,2-dipiperazine compound and diamine. 4,536,564, Cl. 528-341.000.

Wood, Joseph A.; and Peebles, William C., Jr., to Flanders Filters, Inc. Air flow control apparatus. 4,535,811, Cl. 137-601.000.

Word, Nancy S.: *See*—
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Worth, Charles C.; and Young, John N., to Charles C. Worth Corporation. Fishing reel with delayed action brake. 4,535,954, Cl. 242-84.52B.

Wright, Robert B., to B. F. Goodrich Company, The. Inflatable hot tub with cover. 4,535,490, Cl. 4-585.000.

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Wuthrich, Paul; Daigle, Lyman R.; and Daddona, Anthony D., to Timex Corporation. Crown setting switch for a wristwatch. 4,536,095, Cl. 368-321.000.

Wyckoff, Robert L. Method of texturing a surface and articles textured by the method. 4,536,431, Cl. 428-162.000.

Wyss, Robert P., to Augat Inc. Method of assembling adaptor for automatic testing equipment. 4,535,536, Cl. 29-845.000.

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Chiang, Anne; and Meuli, William P., 4,536,251, Cl. 156-657.000.
Hauser, Oscar G.; Lysy, Dusan G.; and Koehler, Richard F., Jr., 4,536,080, Cl. 355-14.00D.
Lippolis, Craig S.; and Nguyen, Tuan A., 4,536,079, Cl. 355-14.00R.
Ng, Dominic S., 4,536,458, Cl. 430-41.000.
Stoffel, James C., 4,536,077, Cl. 355-8.000.
Tam, Man C., 4,536,457, Cl. 430-41.000.
Ziehm, Richard T., 4,536,078, Cl. 355-14.0SH.

Yackiw, Charles, to Schlegel Corporation. Weatherstrip mountable in a slot. 4,535,564, Cl. 49-489.000.

Yakura, John, to California Linear Circuits, Inc. Apparatus for rotating a wafer. 4,535,721, Cl. 118-503.000.

Yamada, Kazuharu: *See*—
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Yamada, Kazuo: *See*—
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Yamada, Magoichi, to Daiwa Golf Co., Ltd. Golf club head. 4,535,990, Cl. 273-173.000.

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Yamaichi Electric Mfg. Co., Ltd.: *See*—
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Yamamoto, Yoshihiko: *See*—
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Yamashiro, Ernest, to Mid-Continent Screw Products Company. Screw fastener. 4,536,117, Cl. 411-411.000.

Yamashita, Kazuo: *See*—
Ishii, Takahito; Yamashita, Kazuo; and Uno, Hiroshi, 4,535,837, Cl. 165-104.170.

Yamashita, Sadahiko: *See*—
Hasegawa, Makoto; Makimoto, Mitsuo; Yamashita, Sadahiko; and Katayama, Yoshio, 4,536,724, Cl. 331-177.00V.

Yamatani, Tetsuo: *See*—
Yonoda, Kiyoshi; Takeuchi, Hiroshi; Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, 4,536,842, Cl. 364-424.000.

Yamawaki, Hiroko, representative: *See*—
Yamawaki, Takesi, deceased; Kusuhara, Masakazu; and Saitou, Tatuya, 4,536,025, Cl. 296-37.160.

Yamawaki, Takesi, deceased (by Yamawaki, Hiroko, representative); Kusuhara, Masakazu; and Saitou, Tatuya, to Toyota Jidosha Kabushiki Kaisha. Package tray trim device for vehicles. 4,536,025, Cl. 296-37.160.

Yamazaki, Atsuo: *See*—
Uehara, Masafumi; Yamazaki, Atsuo; and Shimura, Kazuhiro, 4,536,465, Cl. 430-192.000.

Yamazaki, Kazunori: *See*—
Nara, Michiko; Yamazaki, Kazunori; and Akiyama, Yasuko, 4,536,405, Cl. 514-781.000.

Yanagita, Tomoatsu, to Hitachi, Ltd. Decimal arithmetic unit. 4,536,854, Cl. 364-749.000.

Yanazawa, Hiroshi: *See*—
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Yang, Shiow-Shong: *See*—
Katkocin, Dennis M.; Word, Nancy S.; and Yang, Shiow-Shong, 4,536,477, Cl. 435-205.000.

Yang, Tai-Her. Torque limiting wrench with an audio alarm. 4,535,659, Cl. 81-478.000.

Yano, Masao: *See*—
Matsumura, Susumu; Yano, Masao; Sashida, Nobuo; and Yamamoto, Yoshihiko, 4,536,816, Cl. 361-91.000.

Yarnold, Bart M. Trap stand carrier. 4,535,922, Cl. 224-202.000.

Yasui, Toshihiko; Matsumoto, Tetsuo; and Akaike, Akihiko, to Dainippon Ink and Chemicals, Inc. Method of forming resist pattern. 4,536,468, Cl. 430-296.000.

Yasumuro, Hisakazu: *See*—
Imatani, Tsuneo; Yasumuro, Hisakazu; Watanabe, Michio; Kurashima, Hideo; and Ishibashi, Kazuhisa, 4,536,243, Cl. 156-274.600.

Yeakey, Ernest L.; and Watts, Lewis W., Jr., to Texaco Inc. Polyoxyalkylenepolyacrylamides and the preparation thereof. 4,536,600, Cl. 564-153.000.

Yeakey, Ernest L.: *See*—
Grigsby, Robert A., Jr.; Speranza, George P.; Brennan, Michael E.; and Yeakey, Ernest L., 4,536,522, Cl. 521-172.000.

Yeoman, Alan M.; and Mouche , Richard J., to Nalco Chemical Company. Non-clogging deposit monitor. 4,535,622, Cl. 73-61.200.

Yereance, John G., Jr.: *See*—
Amendola, Albert; Christensen, Richard G.; and Yereance, John G., Jr., 4,536,470, Cl. 430-314.000.

Yokogawa Hokushin Electric Corporation: *See*—
Iwaoka, Hideto; Fujino, Kenji; Sugiyama, Tadashi; and Matsuura, Hiroyuki, 4,536,712, Cl. 324-309.000.

Yokoshima, Minoru; Nawata, Kazuyoshi; Ohkubo, Tetsuo; and Hattori, Hideaki, to Nippon Kayaku Kabushiki Kaisha. Acetal glycol diacrylates and process for producing them. 4,536,588, Cl. 549-374.000.

Yoneda, Kiyoshi; Takeuchi, Hiroshi; Yamatani, Tetsuo; Hijiya, Toyoto; Takeda, Hideo; Shibuya, Koji; and Tanaka, Kiichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. System for measuring interfloor traffic for group control of elevator cars. 4,536,842, Cl. 364-424.000.

Yoon, InBae. Safety puncturing instrument and method. 4,535,773, Cl. 604-51.000.

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Yoshida, Hiroshi; and Niida, Sadao, to Ube Industries, Ltd. Process for preparing 2-alkyl-4-amino-5-aminomethylpyrimidine. 4,536,577, Cl. 544-326.000.
Yoshida, Hitoshi; Tomita, Masahiro; and Takagi, Shigeru, to Nippon Soken, Inc. Exhaust gas cleaning device for internal combustion engine. 4,535,589, Cl. 60-303.000.
Yoshida Kogyo K. K.: *See*—
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Yoshida, Masaru, to Citizen Watch Company Limited. Electronic timepiece with system for synchronizing hands. 4,536,093, Cl. 368-187.000.
Yoshida, Yoshihiro; and Aoki, Hidehiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Stereo amplifier circuit for bichannel signals. 4,536,716, Cl. 330-69.000.
Yoshii, Motokazu: *See*—
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Yoshinaga, Kenji: *See*—
Hashimoto, Kiyoyasu; Yoshinaga, Kenji; Mori, Yoshio; Seino, Junzaburo; Kenmochi, Hirohito; and Sato, Katsunobu, 4,536,569, Cl. 534-575.000.
Yoshinaga, Toru; Igashira, Toshihiko; Kawai, Hisasi; Morino, Seiji; and Nakamura, Norihiko, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Multi-gap spark ignition system. 4,535,735, Cl. 123-310.000.
Young, Bill M.: *See*—
Borchardt, John K.; and Young, Bill M., 4,536,305, Cl. 252-8.55R.
Young, John N.: *See*—
Worth, Charles C.; and Young, John N., 4,535,954, Cl. 242-84.52B.
Young, Scott C. Commode anti-splash device and method. 4,535,491, Cl. 4-658.000.
Yuasa, Masaharu: *See*—
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Zahnradfabrik Friedrichshafen AG: *See*—
Maurer, Dieter; Rauter, Jurgen; and Dziuba, Peter, 4,536,003, Cl. 280-95.00R.
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Zaimi, Sedat: *See*—
Bergen, Henry M.; Zaimi, Sedat; Castellano, Vincenzo; and Schildkraut, Irwin, 4,536,621, Cl. 179-99.00R.
Zampino, Michael J.: *See*—
Mookherjee, Braja D.; Chant, Bernard J.; Evers, William J.; Wilson, Richard A.; Zampino, Michael J.; and Vock, Manfred H., 4,536,583, Cl. 549-1.000.
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Zangenberg, Jan: *See*—
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Zapke, Klaus: *See*—
Albrecht, Johannes; Jakobs, Rudolf; Turna, Osman; Vierrath, Helmut; Weil, Manfred; and Zapke, Klaus, 4,536,193, Cl. 48-77.000.
Zatulovsky, Isaak A.: *See*—
Kaluzhsky, Nikolai A.; Badaliants, Khoren A.; Kostin, Ivan M.; Zatulovsky, Isaak A.; Korneev, Valentin I.; Andreev, Vladimir V.; Kuzmin, Boris A.; Sizyakov, Viktor M.; Shmorgunenko, Nikolai S.; Krochevsky, Vladislav A.; and Alexeev, Alexei I., 4,536,216, Cl. 106-38.300.
Zayauskas, Leo. Radiant heat collector. 4,535,753, Cl. 126-274.000.
Zehl, Otis G.: *See*—
Price, Michael G.; Zehl, Otis G.; and Bonney, Robert D., 4,536,062, Cl. 350-358.000.
Zembayashi, Michio: *See*—
Frye, Robert B.; and Zembayashi, Michio, 4,536,529, Cl. 524-284.000.
Zenith Electronics Corporation: *See*—
Hauge, Raymond C.; and Mycynek, Victor G., 4,536,717, Cl. 330-254.000.
Sutton, Leroy A., 4,536,683, Cl. 315-401.000.
Zerfass, Karl C.; and Urban, Martin, to Hoechst Aktiengesellschaft. Method for covering a length of pipe. 4,535,526, Cl. 29-469.500.
Ziegelheim, Irwin I.; and Lerner, Lawrence, to Discovery Concepts, Inc. Work stations of knock-down modular components. 4,536,044, Cl. 312-257.00R.
Ziegler, Georg, to Sulzer Brothers Limited. Heat exchanger with adjustable platform for cleaning and repairing. 4,535,727, Cl. 122-32.000.
Ziehm, Richard T., to Xerox Corporation. Recirculative document duplex copying. 4,536,078, Cl. 355-14.0SH.
Zinsmeyer, Herbert G., to Specialty Systems, Inc. Internal combustion engine having an exhaust gas turbine. 4,535,592, Cl. 60-597.000.
Zlotnick, Fredrick: *See*—
Reid, Sydney J., Jr.; and Zlotnick, Fredrick, 4,536,798, Cl. 358-197.000.
Znaimer, Samuel: *See*—
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Znameni Politekhnichesky Institut: *See*—
Kosolapov, Gennady M.; Revin, Alexandr A.; Komarov, Jury Y.; Umnyashkin, Vladimir A.; Kondrashkin, Alexandr S.; and Sobolev, Jury A., 4,536,041, Cl. 303-119.000.
Zodrow, Rudolf: *See*—
Buchholz, Rainer; Tomashauser, Josef; Zodrow, Rudolf; and Mohn, Hans-Werner, 4,536,247, Cl. 156-477.100.
Zoecon Corporation: *See*—
Lee, Shy-Fuh; and Henrick, Clive A., 4,536,355, Cl. 260-944.000.
Pearce, Robert C., III, 4,536,388, Cl. 424-28.000.
Zoltan, Bart J., to American Cyanamid Company. Method for determining wound volume. 4,535,782, Cl. 128-665.000.
Zorn, Walter, to Walztechnik Saacke Zorn GmbH & Co. Heavy duty hob. 4,536,106, Cl. 407-25.000.
Zufle, Tim T. Body armor. 4,535,478, Cl. 2-2.500.
Zundwarenfabrik Stracke GmbH & Co.: *See*—
Appel, Hans; and Heidenescher, Hermann, 4,535,830, Cl. 160-299.000.
Zwick, Maurice M., to American Cyanamid Company. Process for the manufacture of equally biaxially oriented film. 4,536,365, Cl. 264-558.000.
Zysset, Edgar H., to Automated Container Corporation. Easy opening container system. 4,535,909, Cl. 220-273.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF AUGUST, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Caterpillar Tractor Co.: *See*—
Nieman, John R.; and Worman, Roger A., Re. 31,972, Cl. 164-362.000.

FMC Corporation: *See*—
Gold, Kenneth S., Re. 31,971, Cl. 73-462.000.

Gold, Kenneth S., to FMC Corporation. Wheel unbalance measurement system and method. Re. 31,971, Cl. 73-462.000.

Honeywell Inc.: *See*—
Mott, Richard C., Re. 31,973, Cl. 236-49.000.

Mott, Richard C., to Honeywell Inc. Fluidic flow sensing and control apparatus. Re. 31,973, Cl. 236-49.000.

Nieman, John R.; and Worman, Roger A., to Caterpillar Tractor Co. Casting mold with constricting device. Re. 31,972, Cl. 164-362.000.

Worman, Roger A.: *See*—
Nieman, John R.; and Worman, Roger A., Re. 31,972, Cl. 164-362.000.

LIST OF DESIGN PATENTEES

Abe, Takeshi: *See*—
Shibayama, Masato; Abe, Takeshi; Koizumi, Kiyohide; Sugimoto, Kouichi; Kusakawa, Hitoshi; and Jinriki, Tatenori, 280,203, Cl. D15-199.000.

Aldridge, Rufus W., Jr., to Spencer Wright Industries, Inc. Grinding machine. 280,202, 8-20-85, Cl. D15-124.000.

Alessandro. Sofa. 280,154, 8-20-85, Cl. D6-381.000.

Alessandro. Table. 280,161, 8-20-85, Cl. D6-480.000.

Alex Synn AG: *See*—
Hopfer, Hans, 280,153, Cl. D6-378.000.

Alger, Andrew L., to Goldsmith, Yamasaki, Specht Inc.; and Uarco Incorporated. Burster or similar article. 280,213, 8-20-85, Cl. D18-34.000.

Allegheny International Exercise Co.: *See*—
Gold, Norman, 280,228, Cl. D21-194.000.
Kasuba, John A.; Kanne, John T.; Dhaliwal, Sajjan S.; Gold, Norman; and Weiss, John, 280,226, Cl. D21-194.000.

Allen, Richard T.; and Hammond, David A., to Hammond, David H. Emergency medical cabinet. 280,156, 8-20-85, Cl. D6-432.000.

Altera Salotti S.R.L.: *See*—
Giudici, Gianbattista, 280,152, Cl. D6-370.000.

American Standard Inc.: *See*—
Niemann, James E., 280,231, Cl. D23-25.000.

An-Teak-Qua Company: *See*—
Hanson, Harold W., Jr., 280,248, Cl. D32-50.000.

AT&T Teletype Corporation: *See*—
Genaro, Donald M.; Tilley, Alvin R.; Purzycki, Alfred Z.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 280,196, Cl. D14-93.000.
Genaro, Donald M.; Tilley, Alvin R.; Purzycki, Alfred Z.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., 280,197, Cl. D14-93.000.

Barbato, Michael W.; Mattson, Ray W.; and Nordgren, Michael R., to Mattel, Inc. Extendable toy car or similar article. 280,223, 8-20-85, Cl. D21-136.000.

Bassett, Howard D., to Union Carbide Corporation. Casserole. 280,175, 8-20-85, Cl. D7-354.000.

Bell & Howell Company: *See*—
Overman, John W.; and Kosner, Jerry J., 280,211, Cl. D18-13.000.

Berry, Richard D., Jr., to Design Institute America, Inc. Etagere. 280,157, 8-20-85, Cl. D6-474.000.

Berry, Richard D., Jr., to Design Institute America, Inc. Etagere. 280,158, 8-20-85, Cl. D6-474.000.

Berry, Richard D., Jr., to Design Institute America, Inc. Table. 280,164, 8-20-85, Cl. D6-489.000.

Blight, Marshall R., to Emeraldine Limited. Boomerang. 280,220, 8-20-85, Cl. D21-85.000.

Bobrick Washroom Equipment Corporation: *See*—
Keck, Henry C., 280,167, Cl. D6-545.000.

Boklund, Carl J., to Wilcoxen, James. Child's lap desk and blackboard. 280,216, 8-20-85, Cl. D19-52.000.

Bossack, Thomas J.; Shipos, Louis E.; and Brown, Frederick M., to NCR Corporation. Ribbon cassette or similar article. 280,212, 8-20-85, Cl. D18-22.000.

Bothe, Hans J. Aircraft. 280,194, 8-20-85, Cl. D12-323.000.

Braun, Claus J. Mini-geiger-counter. 280,183, 8-20-85, Cl. D10-46.000.

Bromley, R. Scott, to Cartier, Inc. Table. 280,162, 8-20-85, Cl. D6-484.000.

Bromley, R. Scott, to Cartier, Inc. Furniture shelf. 280,166, 8-20-85, Cl. D6-511.000.

Brown, Frederick M.: *See*—
Bossack, Thomas J.; Shipos, Louis E.; and Brown, Frederick M., 280,212, Cl. D18-22.000.

Buchet, Marcel, to L'Oreal, S.A. Dual pressed powder compact. 280,244, 8-20-85, Cl. D28-78.000.

Buchet, Marcel, to L'Oreal, S.A. Trio pressed powder compact. 280,245, 8-20-85, Cl. D28-78.000.

Burket, Kenneth A.; and Koenig, Gerhard F., to Corning Glass Works. Shade for light fixtures. 280,239, 8-20-85, Cl. D26-132.000.

Burket, Kenneth A.; Koenig, Gerhard F.; and Maxwell, Richard L., Sr., to Corning Glass Works. Shade for light fixtures. 280,240, 8-20-85, Cl. D26-132.000.

Burket, Kenneth A.; Koenig, Gerhard F.; and Moss, Jay, to Corning Glass Works. Chimney for light fixtures or the like. 280,241, 8-20-85, Cl. D26-132.000.

Burket, Kenneth A.; Koenig, Gerhard F.; and Moss, Jay, to Corning Glass Works. Globe or the like. 280,242, 8-20-85, Cl. D26-134.000.

Burrington, George C.: *See*—
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Burt, David A., to ITW Limited. Twisting fastener. 280,180, 8-20-85, Cl. D8-394.000.

Carbajales Santa-Eulalia, Javier B.: *See*—
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 280,190, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 280,191, Cl. D11-159.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a baby orca. 280,190, 8-20-85, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a rising unicorn. 280,191, 8-20-85, Cl. D11-159.000.

Cartier, Inc.: *See*—
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Bromley, R. Scott, 280,166, Cl. D6-511.000.

Casa Bella Imports, Inc.: *See*—
Matthias, Jan H., 280,155, Cl. D6-383.000.

Cesarczyk, Edward J.: *See*—
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Cesaroni, William C., to Dart Industries Inc. Apparatus for popping corn. 280,174, 8-20-85, Cl. D7-325.000.

Container Corporation of America: *See*—
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Corning Glass Works: *See*—
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Burket, Kenneth A.; Koenig, Gerhard F.; and Maxwell, Richard L., Sr., 280,240, Cl. D26-132.000.
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Burket, Kenneth A.; Koenig, Gerhard F.; and Moss, Jay, 280,242, Cl. D26-134.000.

Cross, Gregory L.; and Cross, Wendell C. Leveling gage. 280,186, 8-20-85, Cl. D10-69.000.

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Crossley, John W. Eye for taxidermy. 280,236, 8-20-85, Cl. D24-33.000.

Daiwa Seiko, Inc.: *See*—
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Dart Industries Inc.: *See*—
Cesaroni, William C., 280,174, Cl. D7-325.000.

De Jiacomo, Velma. Hobby board for sewing and the like. 280,149, 8-20-85, Cl. D3-26.000.

Design Institute America, Inc.: *See*—
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Berry, Richard D., Jr., 280,158, Cl. D6-474.000.
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Dow Chemical Company, The: *See—*
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Drackett Company, The: *See—*
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Eagle, James P. Bicycle exercise support. 280,225, 8-20-85, Cl. D21-191.000.
Edwards, William H. Guitar. 280,207, 8-20-85, Cl. D17-18.000.
Edwards, William H. Guitar. 280,208, 8-20-85, Cl. D17-19.000.
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Fleischmann, Gary A., to Kohler Co. Lavatory faucet shell. 280,233, 8-20-85, Cl. D23-32.000.
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Gaumer, Michael B. Building for the selling of ice cream. 280,237, 8-20-85, Cl. D25-10.000.
Genaro, Donald M.; Tilley, Alvin R.; Purzycki, Alfred Z.; Seidlitz, Raymond R.; and Sokolowski, Eugene K., to AT&T Teletype Corporation. Teleprinter cabinet. 280,196, 8-20-85, Cl. D14-93.000.
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Henry, Robert T. Mattress cover. 280,169, 8-20-85, Cl. D6-603.000.
Hermanson, Merril, to Mr. Christmas Incorporated. Miniature light bulb. 280,238, 8-20-85, Cl. D26-2.000.
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Hornick, Louis, II; and Hornick, Morton, to Louis Hornick & Co., Inc. Bedspread. 280,168, 8-20-85, Cl. D6-603.000.
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Huang, Tien Tsai. Combined pen, watch and tire pressure gauge. 280,215, 8-20-85, Cl. D19-36.000.
Hy-Per-Graph Limited: *See—*
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Interlego AG: *See—*
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543 4,535,647
544 4,535,648
551.9 4,535,649
665 GA 4,535,650
711 4,535,651
733 4,535,652
765 4,535,653

CLASS 75

5 4,536,211
68 B 4,536,212
91 4,536,213
101 R 4,536,214
129 4,536,215

CLASS 76

36 4,535,654

CLASS 81

57.38 4,535,656
124.1 4,535,657
177.85 4,535,658
478 4,535,659
484 4,535,655

CLASS 82

31 4,535,660
40 R 4,535,661

CLASS 83

23 4,535,662
100 4,535,663
162 4,535,664
556 4,535,665
795 4,535,666
830 4,535,667

CLASS 84

1.15 4,535,668
1.26 4,535,669
312 R 4,535,670
422 S 4,535,671

CLASS 87

29 4,535,672
4,535,673
4,535,674
4,535,675

CLASS 89

14.1 4,535,676
46 4,535,677

CLASS 91

29 4,535,678
376 R 4,535,679
4,535,680
527 4,535,681

CLASS 92

153 4,535,682
224 4,535,683

CLASS 98

31 4,535,684
40.12 4,535,685
67 4,535,686

CLASS 99

334 4,535,687
353 4,535,688

CLASS 100

214 4,535,689

CLASS 101

127 4,535,690
230 4,535,691
337 4,535,692
366 4,535,693
395 4,535,694

CLASS 102

240 4,535,695
380 4,535,696
468 4,535,697
529 4,535,698

CLASS 104

7 B 4,535,699
12 4,535,700
258 4,535,701

CLASS 105

4 R 4,535,702

CLASS 106

21 4,536,219
4,536,220
38.3 4,536,216
122 4,536,217
290 4,536,218

CLASS 108

50 4,535,703
108 4,535,704
152 4,535,705

CLASS 110

245 4,535,706
4,535,707
265 4,535,708

CLASS 112

83 4,535,709
199 4,535,711
459 4,535,710

CLASS 114

61 4,535,712
71 4,535,713
103 4,535,825
162 4,535,714
211 4,535,715
221 R 4,535,716
230 4,535,717

CLASS 116

212 4,535,718

CLASS 118

410 4,535,719
415 4,535,720
503 4,535,721
692 4,535,722

CLASS 119

20 4,535,723
29 4,535,724
4,535,725
159 4,535,726

CLASS 122

32 4,535,727

CLASS 123

27 GE 4,535,728
41.1 4,535,729
78 F 4,535,730
90.15 4,535,731
90.16 4,535,732
90.17 4,535,733
90.58 4,535,734
310 4,535,735
344 4,535,736
420 4,535,737
425 4,535,738
4,535,739
435 4,535,740
444 4,535,741
447 4,535,742
472 4,535,743
493 4,535,744
502 4,535,745
556 4,535,746

CLASS 124

87 4,535,747

CLASS 126

25 R 4,535,748
4,535,749
41 B 4,535,750
121 4,535,751
4,535,752
274 4,535,753
419 4,535,754
443 4,535,755
450 4,535,756

CLASS 127

30 4,536,221

CLASS 128

1 D 4,535,757
6 4,535,758
24 A 4,535,759
33 4,535,760
62 A 4,535,761
71 4,535,762
92 A 4,535,763
92 B 4,535,764
203.11 4,535,765
204.23 4,535,766
207.18 4,535,767
305.1 4,535,768
314 4,535,769
327 4,535,770
328 4,535,771
337 4,535,772
419 F 4,535,775
419 PG 4,535,774
4,535,776
421 4,535,777
635 4,535,778
644 4,535,779
659 4,535,780
660 4,535,781
665 4,535,782
711 4,535,783
735 4,535,784
746 4,535,785
760 4,535,786

CLASS 130

27 AE 4,535,788
27 T 4,535,787

CLASS 131

84.1 4,535,789
94 4,535,790
278 4,535,791
281 4,535,792
336 4,535,793

CLASS 133

8 E 4,535,794

CLASS 134

5 4,536,222
93 4,535,795

CLASS 136

249 4,536,607
259 4,536,608

CLASS 137

45 4,535,796
87 4,535,797
174 4,535,799
205 4,535,800
240 4,535,801
322 4,535,802
375 4,535,803
458 4,535,804
489 4,535,805
493.6 4,535,806
533.31 4,535,807
543 4,535,808
596.14 4,535,809
596.17 4,535,810
601 4,535,811
624.11 4,535,812
625.17 4,535,814
625.21 4,535,798
625.48 4,535,815
625.5 4,535,813
625.65 4,535,816
4,535,817
846 4,535,818
4,535,819
854 4,535,820
884 4,535,821

CLASS 138

99 4,535,822

CLASS 140

111 4,535,824

CLASS 141

5 4,535,823
231 4,535,826

CLASS 148

1.5 4,536,223
6.11 4,536,224
6.15 R 4,536,225
4,536,228
12 C 4,536,226
13.1 4,536,227
31.55 4,536,229
31.57 4,536,230
33.1 4,536,231
35 4,536,232
101 4,536,233
133 4,536,234

CLASS 149

19.4 4,536,235
19.92 4,536,236
37 4,536,237

CLASS 152

7 4,535,827

CLASS 156

64 4,536,238
4,536,239
74 4,536,240
89 4,536,241
96 4,536,242
274.6 4,536,243
304.4 4,536,244
307.3 4,536,245
429 4,536,246
477.1 4,536,247
502 4,536,248
643 4,536,249
651 4,536,250
657 4,536,251
662 4,536,252

CLASS 160

84 R 4,535,828
291 4,535,829
299 4,535,830

CLASS 162

30.11 4,536,253
135 4,536,254
358 4,536,255

CLASS 164

33 4,535,831
362 Re.31,972
421 4,535,832

CLASS 165

53 4,535,833
80 R 4,535,834
4,535,835
86 4,535,836
104.17 4,535,837
134 R 4,535,838
153 4,535,839
167 4,535,840
185 4,535,841

CLASS 166

63 4,535,842
250 4,535,843
252 4,535,844
272 4,535,845

CLASS 169

25 4,535,846

CLASS 172

2 4,535,847
311 4,535,848
468 4,535,849

CLASS 173

12 4,535,850

CLASS 174

11 R 4,536,609
26 R 4,536,610
41 4,536,611
48 4,536,612
65 R 4,536,613

CLASS 175

38 4,535,851
170 4,535,852
404 4,535,853

CLASS 177

1 4,535,854
4,535,855
4,535,856
50 4,535,857
134 4,535,858

CLASS 179

18 FA 4,536,614
81 A 4,536,616
81 B 4,536,615
81 R 4,536,617
84 R 4,536,618
4,536,619
90 D 4,536,620
99 R 4,536,621
103 4,536,622
115 R 4,536,623
170 NC 4,536,624

CLASS 180

15 4,535,859
24.05 4,535,860
33.5 4,535,861
68.1 4,535,862
68.5 4,535,863
177 4,535,864
4,535,865
215 4,535,866
294 4,535,867
297 4,535,868
311 4,535,869

CLASS 181

141 4,535,870

CLASS 182

93 4,535,871

CLASS 188

62 4,535,872
72.4 4,535,873
73.1 4,535,874
106 F 4,535,875
311 4,535,876
319 4,535,877

CLASS 190

1 4,535,878

CLASS 192

52 4,535,879

CLASS 198

330 4,535,880
420 4,535,881
425 4,535,882
499 4,535,883
626 4,535,884
695 4,535,885

CLASS 200

5 A 4,536,625
35 R 4,536,626
38 R 4,536,627
43.08 4,536,628
61.45 R 4,536,629
151 4,536,630

CLASS 202

164 4,536,256
177 4,536,257
180 4,536,258

CLASS 204

35.1 4,536,259
37.1 4,536,260
55 R 4,536,261
56 R 4,536,262
98 4,536,263
129.43 4,536,264
159.13 4,536,265
159.18 4,536,266
159.23 4,536,267
182.4 4,536,268
4,536,269
192 E 4,536,271
192 R 4,536,270
243 R 4,536,273
294 4,536,272
433 4,536,274

CLASS 206

205 4,535,886
328 4,535,887
444 4,535,888
527 4,535,889
530 4,535,890
564 4,535,891

CLASS 208

10 4,536,275
11 R 4,536,277
4,536,278
4,536,279
100 4,536,276
106 4,536,280
113 4,536,281
120 4,536,282
309 4,536,283

CLASS 209

3.3 4,535,892
305 4,536,284
628 4,535,893
665 4,535,894
683 4,535,895

CLASS 210

96.1 4,536,285
202 4,536,286
293 4,536,287
325 4,536,288
401 4,536,289
419 4,536,290
457 4,536,291
701 4,536,292
717 4,536,293
730 4,536,294
804 4,536,295

CLASS 211

41 4,535,896
70.6 4,535,897
153 4,535,898

CLASS 212

4,535,899
193 4,535,900

CLASS 215

1 C 4,535,901
4,535,902
213 4,535,903
215 4,535,904
218 4,535,905
329 4,535,906

CLASS 219

10.77 4,536,631
69 D 4,536,633
69 W 4,536,632
74 4,536,634
83 4,536,635
4,536,636
117.1 4,536,637
121 LC 4,536,638
121 LU 4,536,639
121 PR 4,536,640
253 4,536,641
374 4,536,642
400 4,536,643
535 4,536,644
543 4,536,645

CLASS 220

2.1 A 4,535,907
18 4,535,908
273 4,535,909
377 4,535,910
404 4,535,911

CLASS 221

46 4,535,912
251 4,535,913

CLASS 222

52 4,535,914
56 4,535,915
113 4,535,916
129.1 4,535,917
185 4,535,918
190 4,535,919
612 4,535,920

CLASS 223

106 4,535,921

CLASS 224

202 4,535,922
273 4,535,923

CLASS 225

104 4,535,924

CLASS 227

55 4,535,925
67 4,535,926

CLASS 228

6.1 4,535,927

CLASS 229

16 R 4,535,928
39 R 4,535,929
71 4,535,930

CLASS 235

377 4,536,646
379 4,536,647
454 4,536,648

CLASS 236

20 R 4,535,931
49 Re.31,973
4,535,932

CLASS 237

12.3 A 4,535,933
70 4,535,934

CLASS 239

34 4,535,935
117 4,535,936
206 4,535,937
269 4,535,938
533.3 4,535,939

CLASS 241

3 4,535,940
21 4,535,941
36 4,535,942
46.02 4,535,943

CLASS 242

35.5 A 4,535,944
35.6 R 4,535,945
54 R 4,535,946
55.2 4,535,947
4,535,948
57 4,535,949
66 4,535,950
84.2 G 4,535,952
84.21 R 4,535,953
84.52 B 4,535,954
151 4,535,956
158 R 4,535,955
754 4,535,951

CLASS 244

103 R 4,535,957
123 4,535,958

CLASS 246

34 R 4,535,959

CLASS 248

74.5 4,535,960
183 4,535,961
214 4,535,962
251 4,535,963
607 4,535,964

CLASS 249

83 4,535,965

CLASS 250

231 R 4,536,651
231 SE 4,536,649
4,536,650
281 4,536,652
390 4,536,653
458.1 4,536,654
461.1 4,536,655
463.1 4,536,656
492.2 4,536,657
578 4,536,658

CLASS 251

31 4,535,966
54 4,535,967
58 4,535,968
215 4,535,969
315 4,535,970

CLASS 252

8.05 4,536,298
8.5 C 4,536,296
4,536,297
8.55 D 4,536,300
4,536,301
8.55 R 4,536,302
4,536,303
4,536,304
4,536,305
8.6 4,536,299
32.7 E 4,536,306
4,536,307
4,536,308
33 4,536,309
4,536,310
47.5 4,536,312
51.5 A 4,536,311
100 4,536,313
102 4,536,314
174.11 4,536,315
4,536,316
174.17 4,536,317
4,536,318
4,536,319
299.1 4,536,320
299.63 4,536,321
301.16 4,536,322
305 4,536,323
311 4,536,324
314 4,536,325
400 R 4,536,326
511 4,536,327
518 4,536,328
4,536,329
522 R 4,536,330
4,536,349
579 4,536,331

CLASS 254

108 4,535,971
277 4,535,972
323 4,535,973

CLASS 256

1 4,535,974

CLASS 260

97.6 4,536,332
99.5 4,536,333
239 A 4,536,334
245.2 T 4,536,335
351.1 4,536,336
396 R 4,536,337
400 4,536,338
404.5 4,536,339
410.9 R 4,536,340
453 AR 4,536,341
465 D 4,536,345
4,536,346
465 F 4,536,343
4,536,347
465 G 4,536,342
465 R 4,536,344
502.4 P 4,536,348
543 F 4,536,352
543 P 4,536,350
4,536,351
545 R 4,536,353
549 4,536,354
944 4,536,355

CLASS 261

50 R 4,536,356

CLASS 264

53 4,536,357
81 4,536,358
102 4,536,359
142 4,536,360
167 4,536,361
171 4,536,362
182 4,536,363
227 4,536,364
558 4,536,365

CLASS 266

220 4,535,975

CLASS 267

8 R 4,535,976
64.15 4,535,977
91 4,535,978

CLASS 269

45 4,535,979
102 4,535,980

CLASS 271

121 4,535,981
127 4,535,982

CLASS 272

6 4,535,983
78 4,535,984
134 4,535,985

CLASS 273

29 A 4,535,986
32 B 4,535,987
55 D 4,535,988
173 4,535,990
176 FB 4,535,989
193 A 4,535,991
194 A 4,535,992
241 4,535,993
256 4,535,994
273 4,535,995

CLASS 277

1 4,535,996
102 4,535,997
212 FB 4,535,998
235 B 4,535,999

CLASS 279

1 R 4,536,000

CLASS 280

5 C 4,536,001
43.18 4,536,002
95 R 4,536,003
166 4,536,004
289 S 4,536,005
613 4,536,006
701 4,536,007
730 4,536,008
755 4,536,009
802 4,536,010
808 4,536,011

CLASS 281

21 R 4,536,012

CLASS 283

77 4,536,013
83 4,536,014
91 4,536,015
111 4,536,016

CLASS 285

26 4,536,017
229 4,536,018
322 4,536,019

CLASS 290

40 R 4,536,126

CLASS 292

173 4,536,020
201 4,536,021
228 4,536,022

CLASS 294

9 4,536,023
82.24 4,536,024

CLASS 296

37.16 4,536,025

CLASS 297

39 4,536,026
124 4,536,027
224 4,536,028
281 4,536,029
284 4,536,030
353 4,536,031
439 4,536,032

CLASS 298

2 4,536,033

CLASS 299

5 4,536,034
17 4,536,035
43 4,536,036
92 4,536,037

CLASS 301

124 R 4,536,038

CLASS 303

16 4,536,039
37 4,536,040
119 4,536,041

CLASS 307

41 4,536,659
118 4,536,660
119 4,536,661
270 4,536,662
355 4,536,663
475 4,536,664
4,536,665
494 4,536,666
592 4,536,667

CLASS 308

2 A 4,536,042

CLASS 310

75 R 4,536,668
241 4,536,669
249 4,536,670
258 4,536,671
268 4,536,672
327 4,536,673
330 4,536,674

CLASS 312

222 4,536,043
257 R 4,536,044

CLASS 313

46 4,536,675
318 4,536,676
481 4,536,677
493 4,536,678
541 4,536,679

CLASS 315

49 4,536,680
309 4,536,681
387 4,536,682
401 4,536,683
411 4,536,684

CLASS 318

254 4,536,685
434 4,536,686
480 4,536,687
490 4,536,688
565 4,536,689
687 4,536,690
696 4,536,691
723 4,536,692

CLASS 320

1 4,536,693
2 4,536,694
4,536,695
21 4,536,696

CLASS 322

14 4,536,697

CLASS 323

237 4,536,698
276 4,536,699
285 4,536,700
315 4,536,701
316 4,536,702

CLASS 324

52 4,536,703
4,536,704
53 4,536,705
117 R 4,536,706
121 R 4,536,707
174 4,536,708
239 4,536,709
244 4,536,710
306 4,536,711
309 4,536,712
324 4,536,713
338 4,536,714

CLASS 330

2 4,536,715
69 4,536,716
254 4,536,717

CLASS 331

16 4,536,718
37 4,536,719
57 4,536,720
116 R 4,536,721
117 D 4,536,722
127 4,536,723
177 V 4,536,724

CLASS 333

204	4,536,725

CLASS 335

23	4,536,726
54	4,536,727
182	4,536,728
210	4,536,729
213	4,536,730
272	4,536,731
285	4,536,732

CLASS 336

182	4,536,733
196	4,536,734

CLASS 337

159	4,536,735
317	4,536,736

CLASS 339

14 P	4,536,045
31 M	4,536,046
75 M	4,536,047
89 M	4,536,048
97 R	4,536,049
99 R	4,536,050
117 P	4,536,051
126 R	4,536,052
143 R	4,536,053
147 R	4,536,054
258 R	4,536,055

CLASS 340

146.2	4,536,738
323 R	4,536,739
347 AD	4,536,744
347 DA	4,536,743
347 DD	4,536,740
	4,536,741
	4,536,742
	4,536,745
365 A	4,536,746
502	4,536,747
506	4,536,748
525	4,536,749
539	4,536,750
545	4,536,751
554	4,536,752
566	4,536,753
568	4,536,754
573	4,536,755
626	4,536,756
636	4,536,757
664	4,536,758
706	4,536,759
722	4,536,760
825.44	4,536,761
870.02	4,536,762

CLASS 343

5 SA	4,536,764
9 R	4,536,763
372	4,536,766
704	4,536,765
736	4,536,768
785	4,536,767

CLASS 346

1.1	4,536,769
29	4,536,770
74.2	4,536,773
76 PH	4,536,771
	4,536,772
	4,536,774
	4,536,775
140 PD	4,536,777
140 R	4,536,776
160	4,536,778
212	4,536,779

CLASS 350

128	4,536,056
318	4,536,057
320	4,536,058
333	4,536,059
343	4,536,060
354	4,536,061
358	4,536,062
395	4,536,063
583	4,536,064

CLASS 351

239	4,536,065

CLASS 352

35	4,536,066

CLASS 354

180	4,536,067
195.12	4,536,068
265	4,536,069
400	4,536,071
402	4,536,070
403	4,536,072
406	4,536,073
442	4,536,074

CLASS 355

3 DD	4,536,075
3 FU	4,536,076
3 SH	4,536,082
8	4,536,077
14 D	4,536,080
14 R	4,536,079
14 SH	4,536,078
20	4,536,081
40	4,536,083
55	4,536,084
93	4,536,085

CLASS 356

348	4,536,086
350	4,536,087
351	4,536,088
352	4,536,089
414	4,536,090
435	4,536,091

CLASS 357

5	4,536,780
	4,536,781
23.1	4,536,782
38	4,536,783
48	4,536,784
54	4,536,785
68	4,536,786

CLASS 358

38	4,536,787
	4,536,788
99	4,536,789
111	4,536,790
122	4,536,791
139	4,536,792
150	4,536,793
158	4,536,794
160	4,536,795
166	4,536,796
192.1	4,536,797
197	4,536,798
219	4,536,799
243	4,536,800
280	4,536,801
287	4,536,802
299	4,536,803

CLASS 360

4	4,536,804
14.1	4,536,805
69	4,536,806
72.3	4,536,807
74.2	4,536,808
77	4,536,809
94	4,536,810
96.6	4,536,811
133	4,536,812
137	4,536,813

CLASS 361

7	4,536,814
47	4,536,815
91	4,536,816
105	4,536,817
154	4,536,818
274	4,536,819
283	4,536,820
321	4,536,821
340	4,536,822
355	4,536,823
384	4,536,824
386	4,536,825
407	4,536,826

CLASS 362

32	4,536,827
	4,536,828
74	4,536,829
223	4,536,830
263	4,536,831
264	4,536,832
293	4,536,833
303	4,536,834

CLASS 363

163	4,536,835

CLASS 364

200	4,536,836
	4,536,837
	4,536,838
	4,536,839
300	4,536,840
414	4,536,841
424	4,536,842
434	4,536,843
487	4,536,844
500	4,536,845
514	4,536,846
516	4,536,847
526	4,536,848
550	4,536,849
	4,536,850
557	4,536,851
562	4,536,852
718	4,536,853
749	4,536,854
786	4,536,855
900	4,536,856
	4,536,857

CLASS 365

104	4,536,858
154	4,536,859
190	4,536,860

CLASS 366

265	4,536,092

CLASS 367

149	4,536,861
153	4,536,862

CLASS 368

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278	4,536,094
321	4,536,095

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43	4,536,863
44	4,536,864
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112	4,536,866
282	4,536,867
284	4,536,868
287	4,536,869

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82	4,536,872
85	4,536,873
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70	4,536,881

CLASS 378

35	4,536,882
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119	4,536,884

CLASS 381

15	4,536,885
41	4,536,886
92	4,536,887
106	4,536,888

CLASS 400

120	4,536,096
126	4,536,097
196.1	4,536,098

CLASS 401

209	4,536,099

CLASS 403

12	4,536,100
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390	4,536,102

CLASS 404

26	4,536,103

CLASS 406

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214	4,536,107
230	4,536,108
240	4,536,109

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237	4,536,132
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360	4,536,134
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150	4,536,141
227	4,536,142

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11	4,536,366

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37	4,536,367
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65	4,536,369
120	4,536,370
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187	4,536,372
211	4,536,373

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68	4,536,374
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359	4,536,380
437	4,536,381
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556	4,536,384
621	4,536,385

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101	4,536,392
114	4,536,393
154	4,536,394
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526	4,536,150

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250	4,536,407
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298	4,536,166
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DESIGN PATENTS

01	:	280,202	12	:	280,170	21	:	280,231	280,159	280,232	42 : 280,214
04	:	280,211			280,207	24	:	280,156	280,160	280,239	280,236
06	:	280,150			280,208			280,179	280,161	280,240	45 : 280,249
		280,151			280,238	25	:	280,198	280,162	280,241	47 : 280,148
		280,155	17	:	280,146			280,210	280,163	280,242	280,221
		280,167			280,174	26	:	280,189	280,165	37 : 280,157	280,226
		280,223			280,175	27	:	280,145	280,166	280,158	48 : 280,147
		280,229			280,213	33	:	280,216	280,168	280,164	280,195
		280,248			280,227	34	:	280,177	280,171	39 : 280,201	51 : 280,218
08	:	280,149			280,237			280,196	280,172	280,246	55 : 280,185
		280,186			280,243			280,197	280,212	280,247	280,233
09	:	280,188	18	:	280,225	36	:	280,154	280,228	41 : 280,224	

PLANT PATENTS

12	: 5,537	5,541	39	: 5,538	5,539		

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